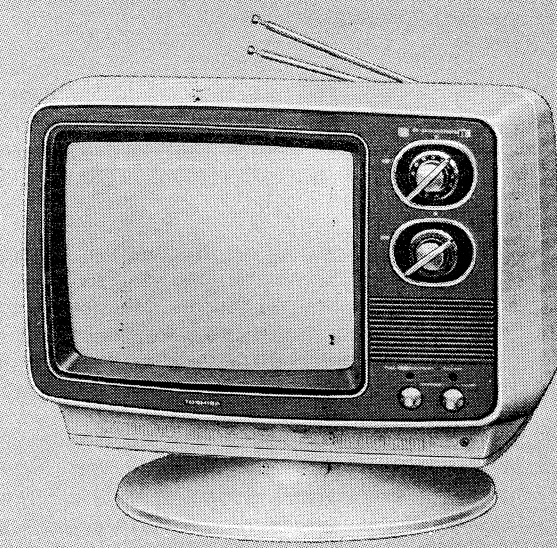
SERVICE DATA
FILE NO. 020-096

TOSHIBA
COLOR TELEVISION
C355:C355C



SPECIFICATIONS

POWER INPUT RATING:	90 watts (nominal), AC 120 volts, 60Hz
ANTENNA INPUT IMPEDANCES:	300 ohm balanced type for VHF and UHF
RECEIVING CHANNELS:	Any of 12 VHF channels ..... channels 2 to 13
	Any of 70 UHF channels ..... channels 14 to 83
INTERMEDIATE FREQUENCIES:	Picture I-F carrier frequency 45.75MHz
	Sound I-F carrier frequency 41.25MHz
	Color sub-carrier frequency 42.17MHz
CHASSIS CONSTRUCTION:	IC-Solid State, (6IC's, 1FU, 23 Transistors, 37 Diodes) Modular Chassis
PICTURE TUBE:	Type No. 370AUB22, 13-inch diagonal
CABINET AND TYPE:	Plastic, Table
DIMENSION:	Height ..... $13\text{-}^{13}/_{16}$ inches
	Width ..... $18\text{-}^{29}/_{32}$ inches
	Depth ..... $16\text{-}^{9}/_{64}$ inches
WEIGHT (NET):	32 lbs.
BUILT-IN ANTENNAS:	VHF telescoping and UHF loop
AUX. TERMINAL:	Earphone Jack
FEATURES:	ABC (with AFT), Instant-ON (with ECONOWATT)

Model C355 Chassis No. TAC520
Model C355C Chassis No. TAC535

WARNING : BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" DESCRIBED BELOW.

X-RAY RADIATION PRECAUTION

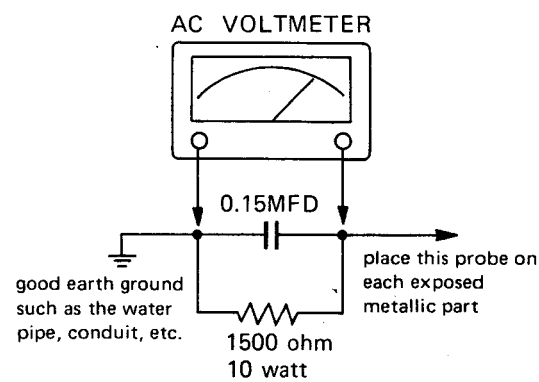
1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is 24.0kv at zero beam current (minimum brightness) under a 120v AC power source. The high voltage must not, under any circumstances, exceed 25.3kv.
   Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure on page 4 of this manual. It is recommended the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. This receiver is equipped with a Fail Safe (FS) circuit which prevents the receiver from producing an excessively high voltage even if the B+voltage increases abnormally. Each time the receiver is serviced, the FS circuit must be checked to determine that the circuit is properly functioning, following the FS CIRCUIT CHECK procedure on page 4 of this manual.
3. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
4. Some parts in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

SAFETY PRECAUTION

WARNING : Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before.

1. Since the chassis of this receiver has hazardous potential to ground whenever the receiver is plugged in (floating chassis), an isolation transformer must be used during service to avoid shock hazard.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatter-proof goggles and keep picture tube away from the body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as: non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.
4. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120v AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner:

   Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd, AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 mfd capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3 volts RMS. This corresponds to 0.2 milliamp. AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.


AC VOLTMETER
0.15MFD
good earth ground such as the water pipe, conduit, etc.
place this probe on each exposed metallic part
1500 ohm
10 watt

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by shading on the schematic diagram and the parts list.
Before replacing any of these components, read the parts list in this manual carefully. The use of a substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

SERVICE NOTE

1. When replacing parts or circuit boards, wind the lead wires around terminals before soldering (Specially Fail Safe Board).
2. When replacing a high wattage resistor (metal oxide film resistor) in circuit board, keep the resistor 10mm away from circuit board.
3. Keep wires away from a high voltage or high temperature portion.

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SUMMARY

Models C355 and C355C are portable type color television receiver succeeding to Models C335 and C335C, and are composed of recently developed 90° deflection, 13-inch picture tube and newly designed IC and Solid State chassis.
The chassis is primarily composed of 6 PW Boards, 4 PW Modules and one FU (Functional Unit).
These modules employ single faced printed wiring board for improving reliability and some of them are interchangeable with those used in current models such as C335 and C094.
In addition to the employment of the slotted mask type shadow mask, the increased high voltage (21.5 KV, 900 μA) has improved the brightness of the screen and the picture sharpness outstandingly.

The VHF tuner is almost the same type as that of Model C335 except for improvement on sensitivity and combination to UHF tuner.
The UHF tuner also has same characteristics as that of Model C335 and besides, 2 MHz tracking performance for easy UHF tuning.
AFT, ABC and ECONOWATT provide the customer with convenience for easier reception.
The cabinet is newly designed for these models. Model C355 and C355C are basically the same. Model C355 is designed to be sold in U.S.A. (UL approved) and Model C355C, in Canada (CSA approved).

FRONT AND REAR CONTROL VIEWS

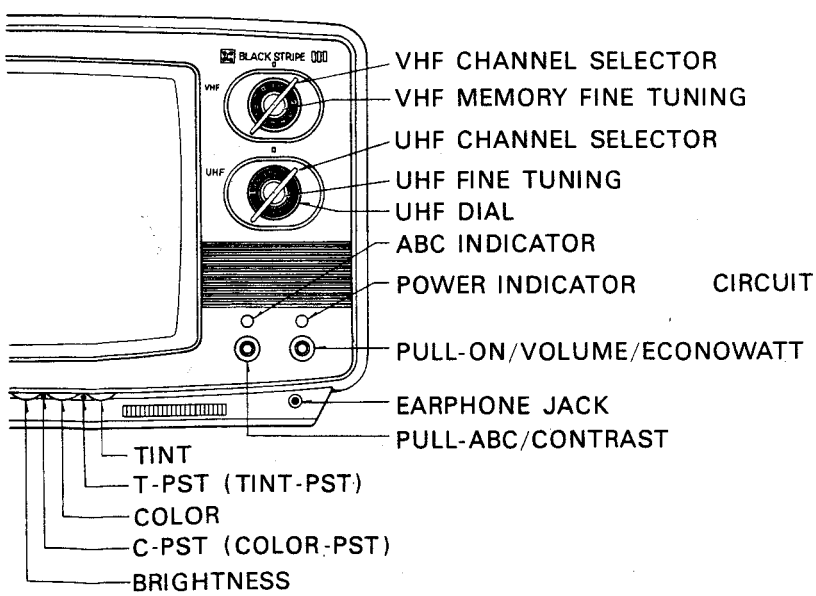


Figure 1. Front Controls View

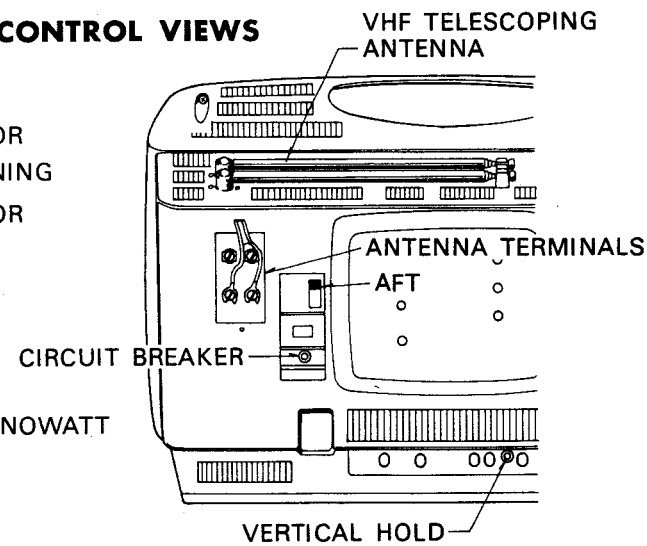


Figure 2. Rear Controls View

WARNING : BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

INSTALLATION AND SERVICE ADJUSTMENTS

GENERAL

In the majority of cases, a color television receiver will need only slight touch-up adjustment upon installation.

Check the basic characteristics such as width, height, vertical sync. horizontal sync. convergence, and focus.

Observe the picture for good black and white details without objectionable color shading. If color shading is evident, demagnetize the receiver.

If color shading still persists, perform purity and static convergence adjustments. This should be all that is necessary to achieve optimum receiver performance. For power supply circuit protection, reset type circuit breaker is provided. To reset the breaker, simply push the button located at the rear of the receiver in and release. The breaker is reset when the button reaches the outer position.

VERTICAL OSCILLATOR ADJUSTMENT

If the picture moves up or down on the screen, adjust the VERTICAL HOLD Control (R351) at the rear of the receiver.

HORIZONTAL OSCILLATOR ADJUSTMENT

If there is an indication of unstable horizontal sync., adjust the core of HORIZONTAL HOLD (L401) shown in figure 6 to remove the condition. Adjust the core to the center of the pull-in range.

+130 VOLT POWER SUPPLY ADJUSTMENT

CAUTION: B+voltage closely relates to the high voltage. To prevent hazardous X-RAY RADIATION, the B+voltage must be properly adjusted to +130 volts.

1. Tune in an air signal. Adjust the BRIGHTNESS and CONTRAST Controls for normal picture.
2. Check that the AC power line voltage is normal. (AC 120 volts, 60Hz).
3. Connect a VTVM between Terminal TP-91 on Power Board (See figure 5) and chassis ground.
4. Adjust the B+ADJ. (R851) on the Power Board (See figure 5) for +130 volts reading. Remove the VTVM.

VERTICAL LINEARITY ADJUSTMENT

Adjust the VERTICAL LINEARITY Control R353 shown in figure 6 to obtain the best vertical linearity. Adjustment using a test pattern is desirable. When using a test pattern, adjust the control for obtaining a symmetrical pattern from top to bottom on the screen.

HEIGHT ADJUSTMENT

The HEIGHT Control (R352) shown in figure 6 changes the size of the picture or pattern. Make final adjustment to overscan the mask about 10% vertically.

FOCUS ADJUSTMENT

Adjust the FOCUS Control (R452) shown in figure 6 for well defined scanning lines on the picture screen.

WIDTH ADJUSTMENT

If the picture screen shows poor horizontal width, re-connect the tip plug M481 and M482 shown in figure 5 to connection mode S, M or L for obtaining proper width.

PLUG CONNECTION MODE

Picture Width	M481 and M482 Connection
S : Narrow	M481 to pin 1 (C442), M482 to pin 2 (C443)
M: Middle	M481 to pin 1 (C442), M482 to pin 3 (Idle pin)
L : Wide	M481 to pin 2 (C443), M482 to pin 3 (Idle pin)

CAUTION : Before re-connecting the tips, the receiver must be turned off to prevent the horizontal output transistor from damage.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. The +130 volt power supply must be properly adjusted to insure the correct high voltage.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST Controls to minimum (zero beam current).
3. High voltage will be measured below 25.3kv.
4. Rotate the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 25.3kv under any conditions.

FS CIRCUIT CHECK

The Fail Safe (FS) circuit check is indispensable for the final check in the servicing. Checking should be done following the steps below.

1. Turn the power switch on and adjust customer controls for normal operation.
2. Temporarily short TP-A and TP-B on FS Board (See figure 5) with a jumper wire. Raster and sound will disappear.
3. The receiver must remain in this state even after removing the jumper wire. This is the evidence that the FS circuit is functioning properly.
4. To obtain a picture again, temporarily turn the receiver off and allow 30 seconds to reset the FS circuit to stand-by state. Then turn the power switch on to produce a normal picture.
5. After making the above shorting test for TP-A and TP-B, proceed with same test for TP-C and TP-D. The result should be the same.

AGC ADJUSTMENT

1. Disconnect the tuner I-F cable from TP-11 (phono jack) on Picture I-F Module (See figure 14).
2. Connect DC meter (0-10v scale) between TP-12 on Mother Board (See figure 5) and chassis ground.
3. Adjust AGC Control (R151) shown in figure 14 for +5 volts reading.
4. Re-connect tuner I-F cable, and tune in the strongest station in your area.

5. Turn the AGC DELAY Control (R152) shown in figure 6 fully counterclockwise, then turn it clockwise until snow noise just disappears from the screen.

COLOR-PST AND TINT-PST ADJUSTMENT

1. Tune in a color program and activate the ABC.
2. Set the COLOR and TINT Controls to mid-position.
3. Adjust the COLOR-PST Control R551 (See figure 5) for natural color intensity.
4. Adjust the TINT-PST Control R557 (See figure 5) for proper facial tones.

COLOR PURITY ADJUSTMENT

NOTE: Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes.

1. Demagnetize the picture tube and cabinet using a degaussing coil.
2. Turn the CONTRAST and BRIGHTNESS Controls to maximum.
3. Ground the red and blue screen grids of the picture tube with jumper wires to provide only a green raster. Advance the GREEN SCREEN Control (on CRT Drive Board), if necessary.
4. Loosen the clamp screw holding the yoke, and slide the yoke backward to provide vertical green belt (zone) in the center area of the picture screen.
5. Rotate and spread the tabs of the purity magnet around the neck of the picture tube until a green belt is obtained in the center of the screen. And at the same time, locate the picture center at the screen center (vertically) by adjusting the magnet.
6. Move the yoke slowly forward until a uniform green screen is obtained. Tighten the clamp screw.
7. Check the purity of the red and blue screens by re-connecting the jumper wires. Make finishing touch to secure the best possible purity on the red, green, and blue screens.
8. To obtain a white raster, refer to "CRT GRAY SCALE ADJUSTMENT".

CRT GRAY SCALE ADJUSTMENT

1. Set the COLOR Control to minimum.
2. Disconnect the RASTER TIP M901 from terminal 12 on Mother Board. (See figure 5).
3. Adjust RED, GREEN and BLUE SCREEN Controls shown in figure 6 to obtain gray raster of low brightness.
4. Re-connect the RASTER TIP.
5. Adjust the BRIGHTNESS and CONTRAST Controls to maximum.
6. Adjust the BLUE DRIVE (R253) and GREEN DRIVE (R252) Controls shown in figure 6 to obtain proper white-balanced picture in high light areas.
7. Repeat steps 2 through 6 for correct gray scale.

SUB-BRIGHTNESS ADJUSTMENT

1. Disconnect tuner I-F cable from TP-11 (phono jack) on Picture I-F Module (See figure 14).
2. Check that the voltage at terminal TP-12 on Mother Board is +5 volts. If not, adjust the AGC Control (R151). Refer to AGC ADJUSTMENT.
3. Connect a DC VTVM between terminal Y and terminal Z on Mother Board (See figure 5).
   Set the BRIGHTNESS and CONTRAST Controls to maximum.
4. Adjust the SUB-BRIGHTNESS Control (R257) on Mother Board (See figure 6) for +0.83 volt on VTVM.
5. Re-connect the tuner I-F cable and remove the VTVM.
6. Tune in an air signal and check the picture intensity by rotating the BRIGHTNESS Control to both extremes. If the picture appears too dark or shows evidence of brooming due to too bright picture, remove the condition by readjusting the SUB-BRIGHTNESS Control (R257).

CONVERGENCE ADJUSTMENTS

■ STATIC (CENTER) CONVERGENCE ADJUSTMENT:

1. Connect a dot-crosshatch signal generator to the antenna terminal to provide a dot pattern on the picture screen.
2. Adjust the BRIGHTNESS and CONTRAST Controls for well defined pattern.
3. Refer to the dots in the center area of the screen. Rotate each of DC magnets ($R\text{-}Mg_1$, $R\text{-}Mg_2$, $B\text{-}Mg_1$, and $B\text{-}Mg_2$ shown in figure 4) to attain convergence at the center of the screen. Notice that red and blue dots move diagonally by rotating the magnets while green dot does not move. To facilitate center convergence, converge the red and green dots, thus forming a yellow dot, then superimpose the blue dot on the yellow dot, thus forming a white dot.

■ DYNAMIC CONVERGENCE ADJUSTMENT:

1. After completing the static convergence adjustment, set the dot-crosshatch signal generator to produce a crosshatch pattern. Touch up the BRIGHTNESS and CONTRAST Controls for well defined pattern.
2. Adjust R/B-1 Control (L702) to superimpose the vertical red and blue lines at the right side.
3. Adjust R/B-2 Control (R751) to superimpose the vertical red and blue lines at the left side.
4. Recheck the static convergence, and readjust it if necessary. If the static convergence adjustment is required, repeat above steps.
5. If vertical mis-convergence (divergence of horizontal lines) as shown in figure 4 appears on the screen, adjust the convergence differential coil located on the top of the deflection yoke to converge the horizontal line.

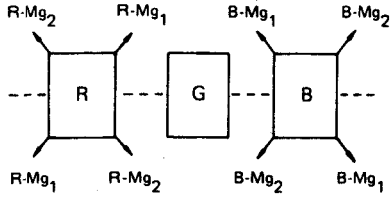


Figure 3. Dot Movement Pattern

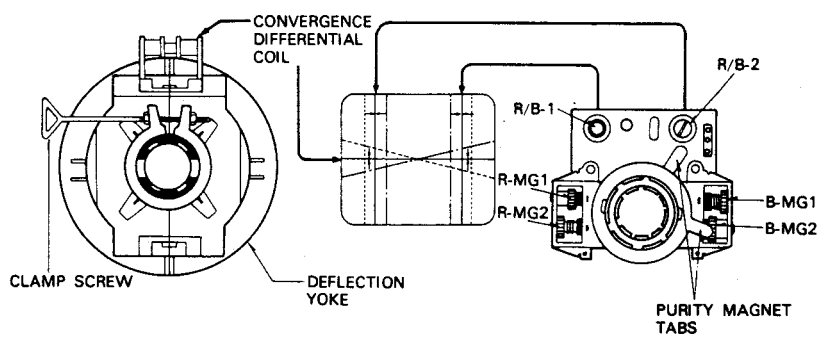


Figure 4. Dynamic Convergence Adjustment

CHASSIS TOP AND REAR VIEWS

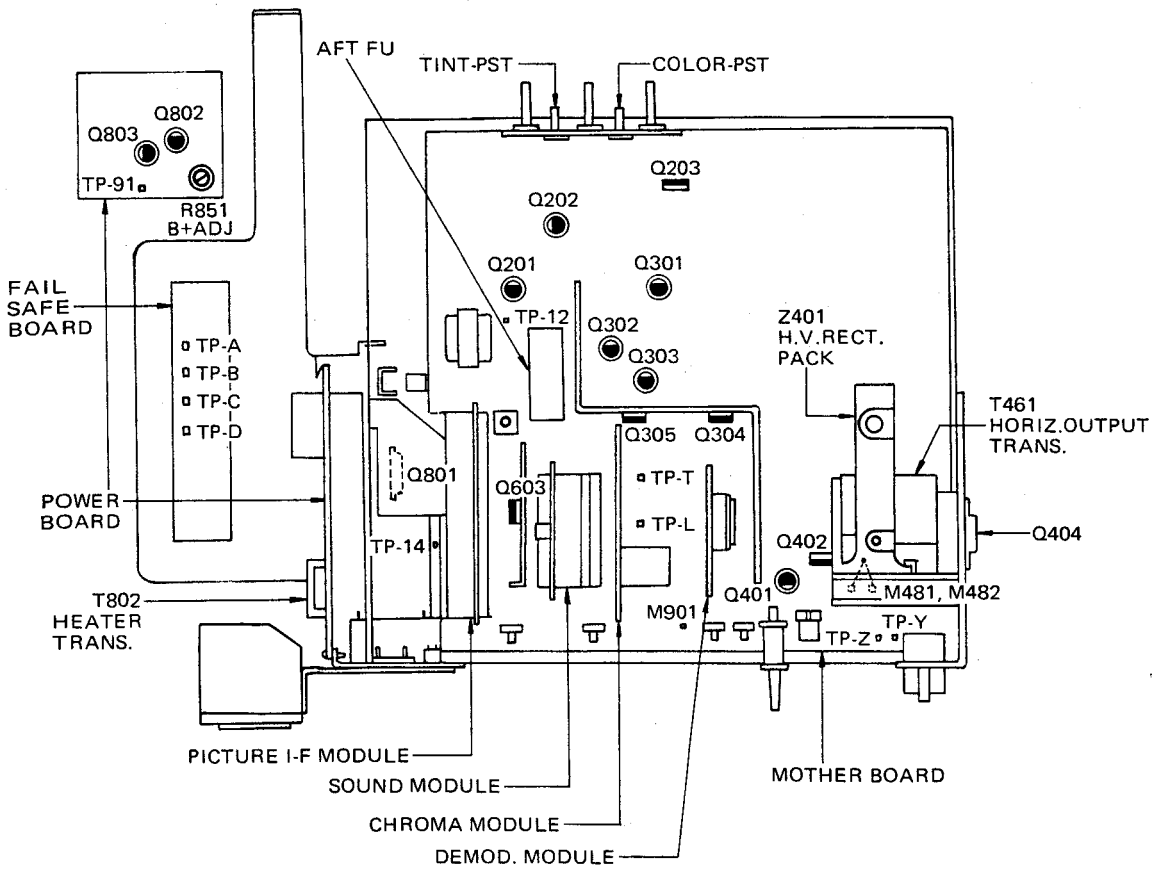


Figure 5. Chassis Top View

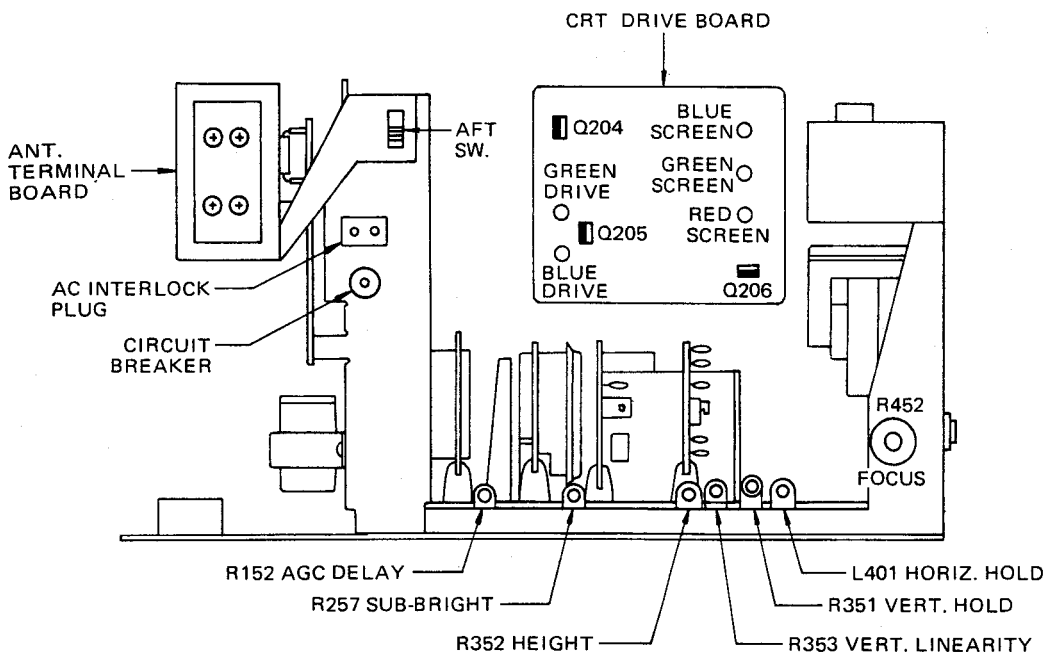


Figure 6. Chassis Rear View

MECHANICAL DISASSEMBLIES

REAR COVER REMOVAL (See figure 7)

1. Disconnect the antenna leads from the antenna terminals.
2. Remove 2 screws securing the antenna terminal board to the rear cover.
3. Remove 5 screws securing the rear cover to the cabinet front and detach the rear cover.

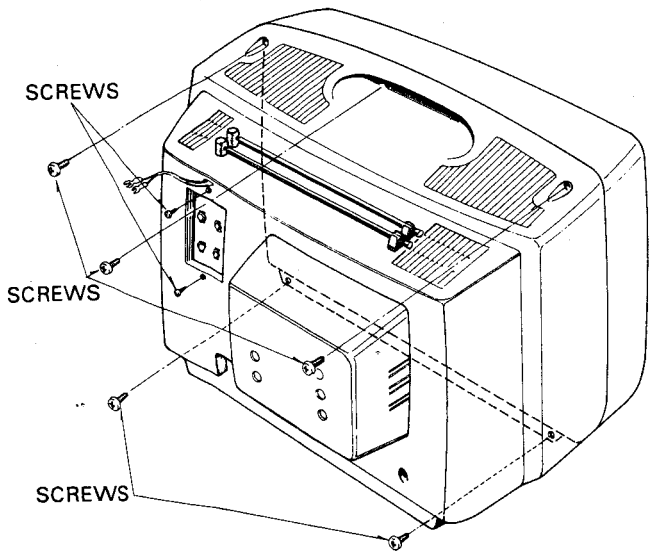


Figure 7. Rear Cover Removal

CHASSIS REMOVAL (See figure 8)

Following the steps under REAR COVER REMOVAL, proceed as follows:

1. Unsolder and disconnct the CRT grounding wire (A) connectted to terminal 11 of CRT Drive Board.
   Disconnect the CRT grounding wire (B) by removing screw (A) (See figure 9).
2. Detach the picture tube anode cap.
3. Unplug the degausser socket on the Power Board.
4. Disconnect a grounding wire come from rear control bracket by removing a screw at the chassis top.
5. Detach the picture tube socket (CRT Drive Board).
6. Unplug a socket on the convergence board.
7. Unplug the deflection yoke socket and speaker socket on the Mother Board.
8. Remove 1 screw (A) securing the antenna terminal board to the chassis and detach the antenna terminal board.
9. Remove 1 screw (B) securing the chassis to the cabinet and draw out the chassis.

CONTROL BRACKET REMOVAL (See figure 9)

Following the steps under CHASSIS REMOVAL, proceed as follows:

1. Remove front control knobs (VHF and UHF CHANNEL Selector, VHF and UHF TUNING, UHF DIAL, PULL-ON/VOLUME/ECONO-WATT, PULL-ABC/CONTRAST).
2. Remove 3 screws (A) and loosen 1 screw (B) securing the control bracket to the cabinet.
3. Detach the control bracket.

Note: The speaker is mounted on the cabinet front, being pushed by a portion of the control bracket through rubber cushion, without any screw.
When removing or mounting the control bracket, take care of the speaker.

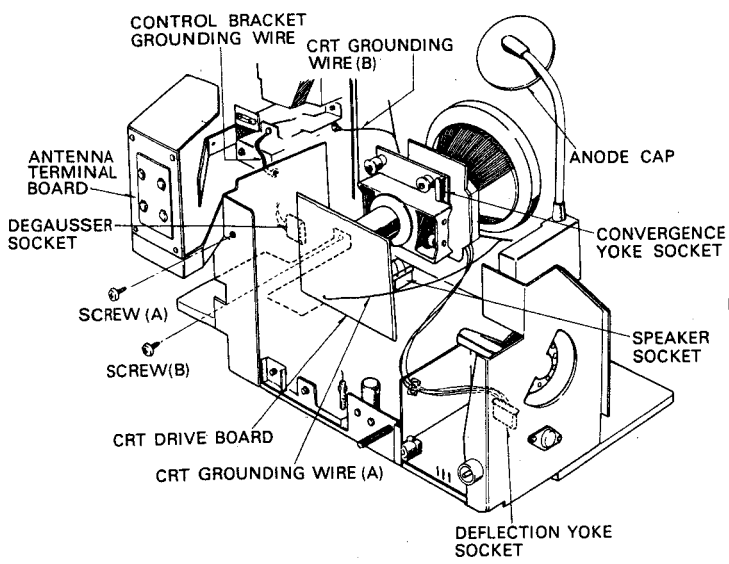


Figure 8. Chassis Removal

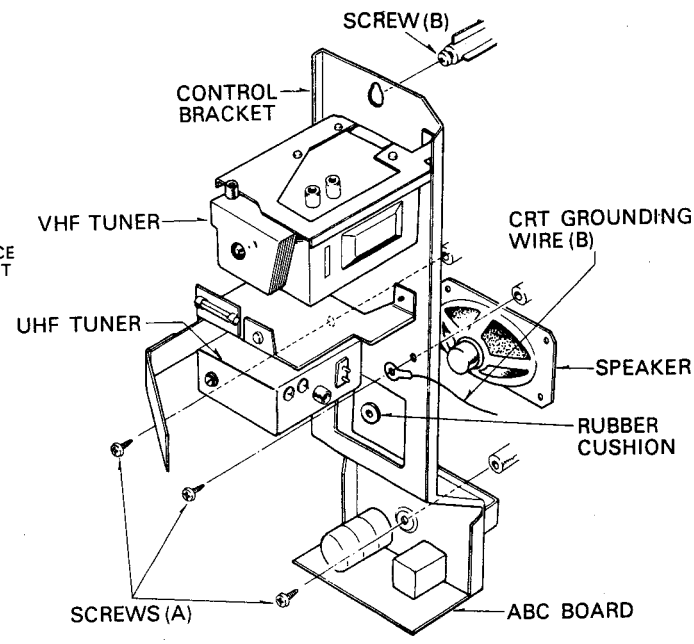


Figure 9. Control Bracket Removal

PICTURE TUBE REMOVAL (See figure 10)

Following the steps under CHASSIS REMOVAL and CONTROL BRACKETS REMOVAL, proceed as follows:

1. Place the cabinet with the front down on a rolled pad or some suitable cushion placed near the top edge of the front bezel.
2. Detach the convergence assembly and the deflection yoke by loosening the clamp screws.
3. Remove 4 screws securing the picture tube to the cabinet and detach the picture tube.
4. Detach the CRT grounding wire which is attached to the picture tube lugs with spring.

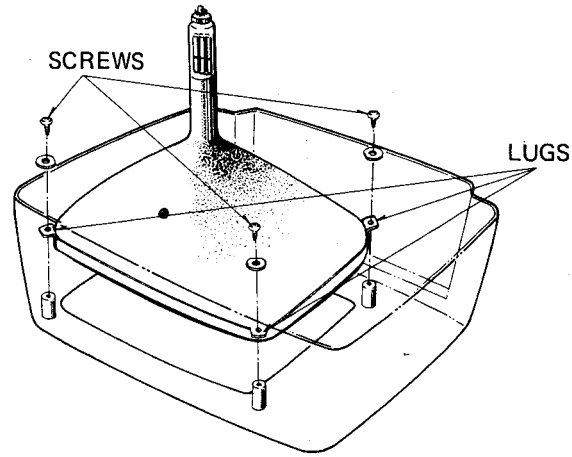


Figure 10. Picture Tube Removal

VHF TUNER REMOVAL (See figure 11)

Following the steps under CONTROL BRACKETS REMOVAL, proceed as follows:

1. Disconnect all the wires from the VHF tuner; AFT-1 lead (YEL.), AFT-2 lead (WHT.), B+ lead (ORN.), AGC lead (VLT.), I-F output coaxial cable, UHF B+ lead (ORN.), resistor R061, capacitors C061, C062, UHF I-F input coaxial cable and VHF input cable.
2. Remove 3 screws (A) securing the VHF tuner to the bracket and detach the tuner.

UHF TUNER REMOVAL (See figure 11)

Following the steps under CONTROL BRACKETS REMOVAL, proceed as follows:

1. Disconnect all the wires from the UHF tuner; UHF antenna lead, resistor R061, AFT lead (WHT.), capacitor C063, and UHF I-F output coaxial cable.
2. Remove 3 screws (B) and detach the UHF tuner sub-bracket.
3. Remove 3 screws (C) and detach the UHF tuner.

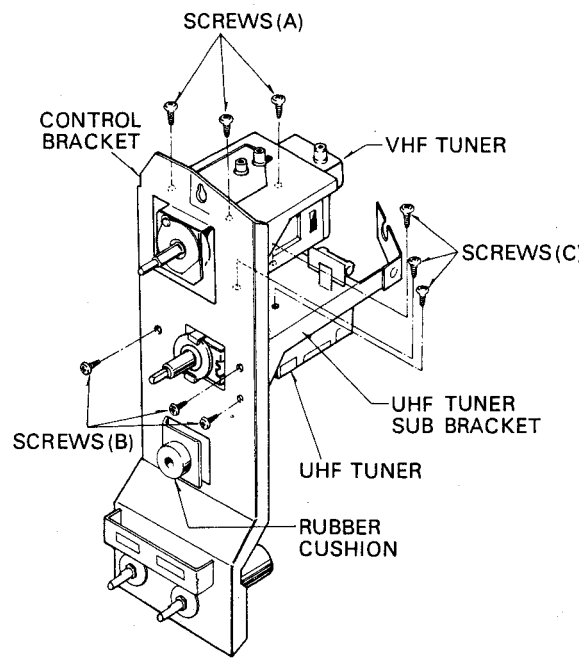


Figure 11. VHF & UHF Tuner Removal

MODULE HOLDER REMOVAL (See figure 12)

P.W. modules removal requires removing the module holder by pinching the sides of the holder strongly as shown in figure 12.

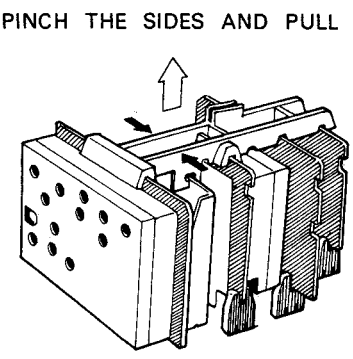


Figure 12. Module Holder Removal

GENERAL ALIGNMENT INSTRUCTIONS

THIS RECEIVER IS TRANSISTORIZED AND SPECIAL CARE MUST BE TAKEN WHEN SERVICING. READ THE FOLLOWING NOTES BEFORE ATTEMPTING ALIGNMENT.

- Alignment requires an exacting procedure and should be undertaken only when necessary.
- Isolation transformer must be used to prevent shock hazard.
- The test equipment specified or its equivalent is required to perform the alignment properly. Use of equipment which does not meet these requirements may result in improper alignment.
- Correct matching of the equipment is essential. Failure to use proper matching will result in responses which cannot represent the true operation of the receiver.
- Use of excessive signal from a sweep generator can cause overloading of receiver circuit. Overloading should be avoided to obtain a true response curve. Insertion of markers from the marker generator should not cause distortion of the response.
- The AC power line voltage should be kept within from 115 to 125 volts while alignment.
- Do not attempt to connect or disconnect any wire while the receiver is in operation. Make sure the power cord is disconnected before replacing any parts in the receiver.

TEST EQUIPMENT

VACUUM-TUBE VOLTMETER	B&K Model 177 or equivalent
OSCILLOSCOPE	B&K Model 1460, 1465 or equivalent
DIRECT/LOW-CAPACITY PROBE	B&K Model PR-20, PR-14 or equivalent (Accessory of oscilloscope)
COLOR-BAR/DOT/CROSSHATCH GENERATOR	Leader Model LCG388 or equivalent
SWEEP/MARKER ALIGNMENT GENERATOR	B&K Model 415 or equivalent
BIAS SUPPLY	B&K Model PR-151 or equivalent (Combined in Model 415 generator)
MATCHING PAD	B&K Model TP-41 (Accessory of Model 415 generator)
ISOLATION TRANSFORMER	Voltage adjustable type having capacity of more than 150 watts

PICTURE I-F SWEEP ALIGNMENT

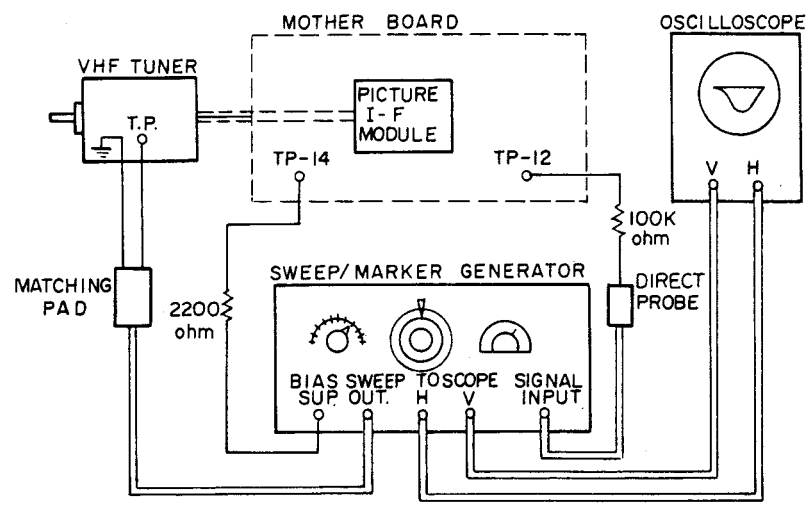


Figure 13. Picture I-F Sweep Alignment

PICTURE I-F SWEEP ALIGNMENT (CONTINUED)

Refer to figures 13 and 14 for alignment points and test equipment connections.

1. Connect the sweep/marker generator in series with matching pad to Test Point (Mixer Base) on VHF tuner. (See page 20). Tune to 40 – 50MHz sweep.
2. Connect the oscilloscope with direct probe to terminal TP-12 on Mother Board (See figure 5) through 100k ohm resistor.
3. Apply +7 volt bias to terminal TP-14 on Mother Board (See figure 5) through 2200 ohm resistor.
4. Turn the AGC Control (R151) shown in figure 14 and AGC DELAY Control (R152) shown in figure 6 fully clockwise.
5. Place the AFT switch to the OFF position. Disconnect the antenna leads. Turn the receiver on.
6. Proceed with the alignment steps following the chart below.

STEP	SWEEP/MARKER GENERATOR	ADJUST	REMARKS
TRAP ALIGNMENT			
Set oscilloscope gain for 0.5v/cm. Adjust sweep output for easy alignment.			
1. 47.25MHz Adjacent Sound Trap.	47.25MHz Marker ON	+1.5MHz Trap (T101)	Adjust T101 for minimum display at 47.25MHz on scope. (See figure 15).
2. 41.25MHz Sound Trap	41.25MHz Marker ON	−4.5MHz Trap (T102, T108)	Adjust T102 and T108 for minimum display at 41.25MHz on scope. (See figure 15).
3. 39.75MHz Adjacent Video Trap	39.75MHz Marker ON	−6MHz Trap (T103)	Adjust T103 for minimum display at 39.75MHz on scope. (See figure 15).
OVERALL RESPONSE ALIGNMENT			
Observe with 2.5 volts p-p on scope. Adjust sweep output and bias voltage for easy alignment.			
4. I-F Overall Response	45.75MHz, 42.17MHz Marker ON	T104, T105 T106, T107 and T109	Alternately adjust T104, T105, T106, T107 and T109 for response shown in figure 16.
After completing the above steps, disconnect equipment and adjust the AGC circuit following AGC ADJUSTMENT on page 4.			

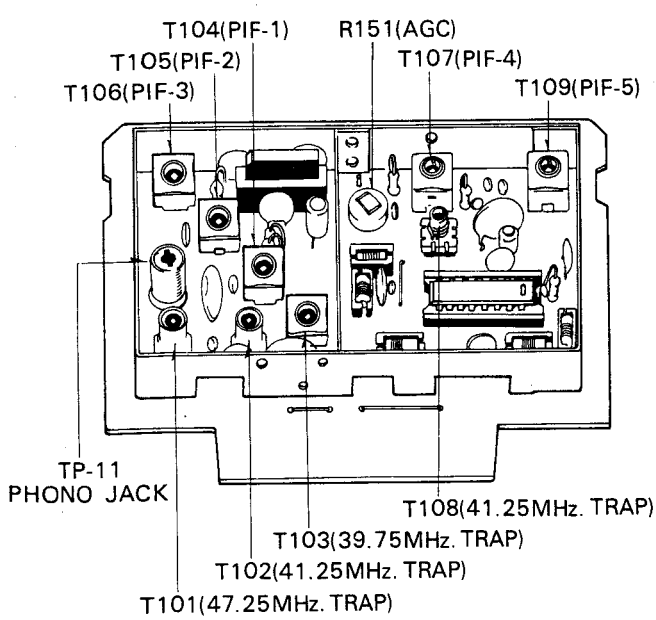


Figure 14. Picture I-F Module Alignment Points

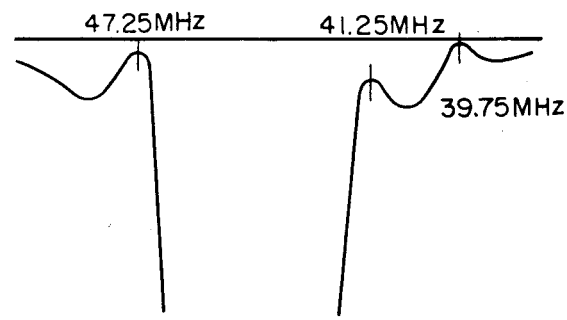


Figure 15. Magnified Response Curve

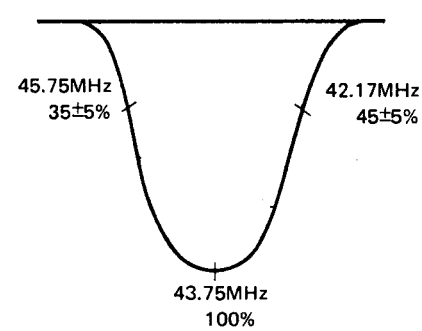


Figure 16. Overall Response Curve

CHROMA TAKE-OFF AND BANDPASS ALIGNMENT

Refer to figures 17 and 18 for alignment points and test equipment connections.

1. Apply +10 volt bias to terminal TP-14 on Mother Board (See figure 5), through 2200 ohm resistor to cut off the I-F stage amp.
2. Set the ABC switch to the OFF position. Set the TINT and COLOR Controls to mid-positions. Turn the receiver on.
3. Proceed with the alignment steps following the chart below.

STEP	SWEEP/MARKER GENERATOR	ADJUST	REMARKS
CHROMA TAKE-OFF ALIGNMENT Connect sweep/marker generator through input matching pad to terminal T on Mother Board. (See figure 5) Tune to 0—8MHz sweep, and connect oscilloscope through detector probe to terminal TP-41 on Chroma Module. (See figure 18)			
1. Chroma Take-Off	3.58MHz, 4.5 MHz, 6.0MHz	L501 (See figure 18)	Adjust L501 to peak at about 4.5MHz. (See figure 19).
CHROMA BANDPASS ALIGNMENT Connect sweep/marker generator through input matching pad to terminal TP-41 on Chroma Module. (See figure 18) Tune to 0—5MHz sweep, and connect oscilloscope through detector probe to terminal V on Chroma Module. (See figure 18)			
2. Chroma Bandpass	3.08MHz, 3.58MHz, 4.08MHz	T501 (See figure 18)	Adjust T501 for symmetrical response at 3.58MHz. (See figure 20)

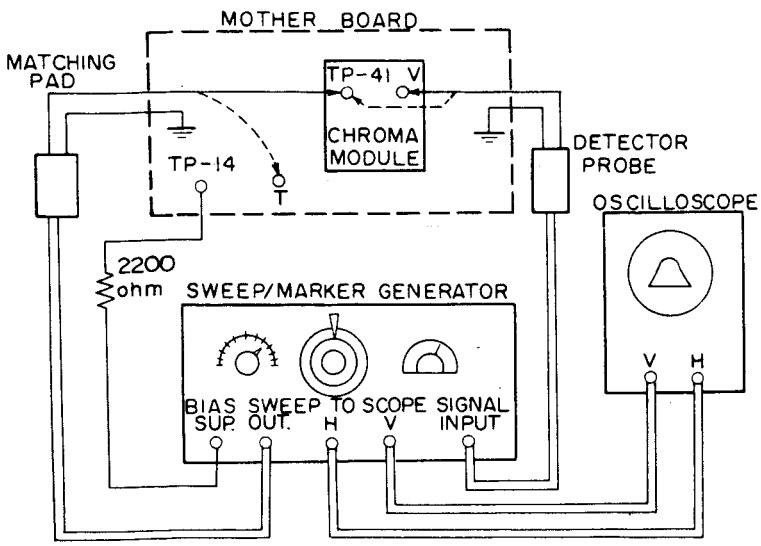


Figure 17. Chroma Take-off and Bandpass Alignment

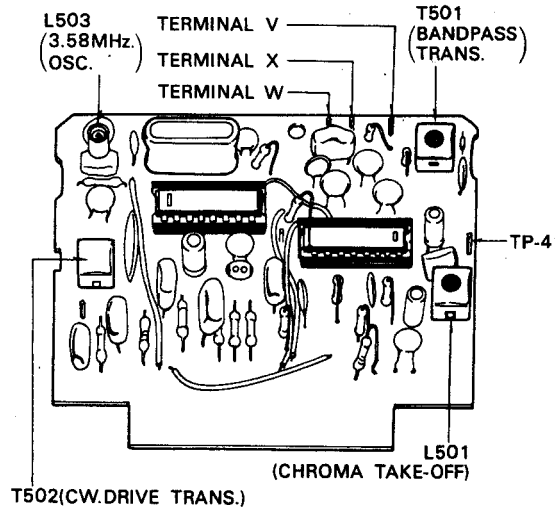


Figure 18. Chroma Module Alignment Points

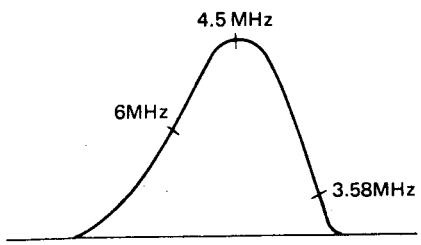


Figure 19. Take-off Response

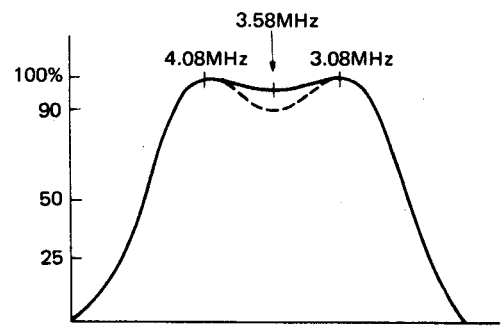


Figure 20. Bandpass Response

AFPC (Automatic Frequency and Phase Control) ALIGNMENT

COLOR SYNC. ADJUSTMENT

1. Use color air signal or color bar generator.
2. Adjust the COLOR Control to maximum, and place the TINT Control to mid-position.
3. Connect the +15v line to terminal "L" on Mother Board (See figure 5) with a short clip lead.
4. Ground burst signal by connecting terminal "X" to "W" on Chroma Module (See figure 18) with a short clip lead.
5. Adjust the 3.58MHz Osc. Coil (L503) on Chroma Module (See figure 18) so that the color bar pattern stands still or drifts slowly across the picture screen.
6. Remove the short clip leads.

COLOR PHASE ADJUSTMENT

1. Connect a color bar generator to VHF Antenna Terminal and fine tune receiver for the best picture.
2. Turn the CONTRAST Control fully clockwise.
3. Place the TINT and COLOR Controls to mid-positions.
4. Connect oscilloscope through a low capacity probe to blue output (to collector of Q206 on CRT Drive Board shown on page 16).
5. Adjust T502 on Chroma Module (See figure 18) for the response shown in figure 21.

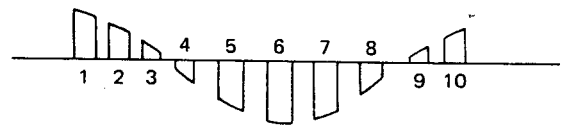


Figure 21. Blue Output (Nominal Phase)

4.5MHz TRAP ALIGNMENT

1. Set the CHANNEL SELECTOR to an active channel. Set the AFT switch to the OFF position.
2. Connect oscilloscope through low capacity probe to terminal T on Mother Board (See page 14)
3. Turn the VHF FINE TUNING Control slightly clockwise for indication of 4.5MHz beat on scope (See figure 22).
4. Adjust 4.5MHz trap (Z201) on Mother Board (See page 15) until 4.5MHz beat component decreases to minimum amplitude. (See figure 22).

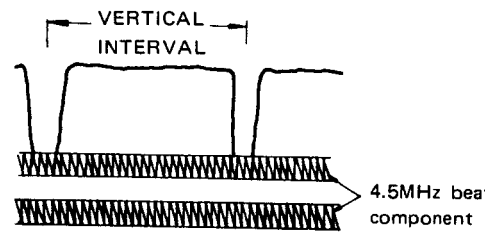


Figure 22. 4.5MHz Beat Component

AFT (Automatic Fine Tuning) ALIGNMENT

1. Place the AFT switch in the OFF position. Tune the set to an active channel and adjust fine tuning for the best picture.
2. Place the AFT switch in the ON position, and adjust "f" trans. on AFT Functional Unit for the best picture. Picture quality should be the same as that obtained in step 1.
3. Check PULL-IN action by turning the AFT switch on and off while rotating the VHF MEMORY FINE TUNING Control clockwise and counterclockwise.

NOTE: Do not attempt adjustment on "S" transformer. This transformer is pre-adjusted by FU manufacturer, using special signal and equipment. Adjustment of "S" transformer may result in unstable AFT operation.

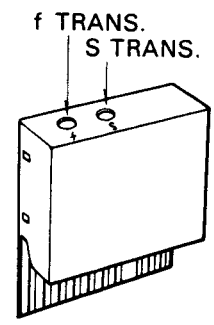
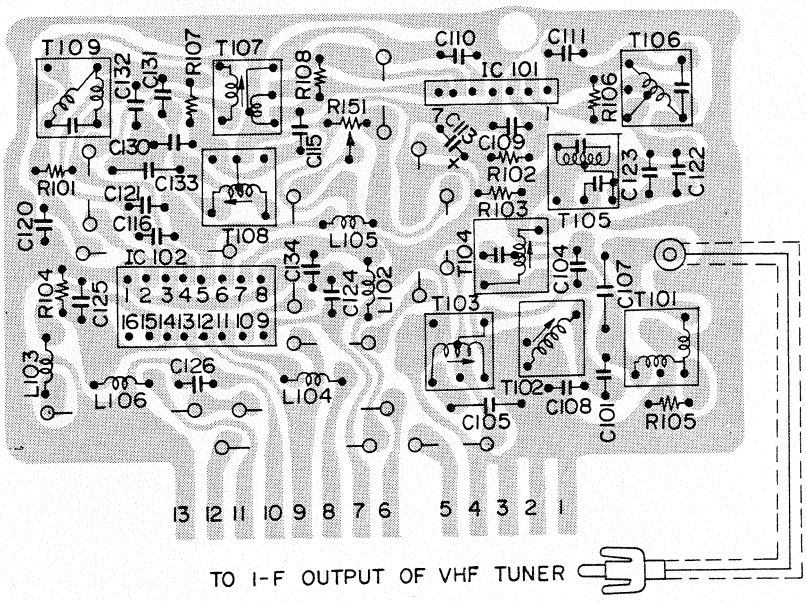


Figure 23. Location of Adjustments on AFT Functional Unit

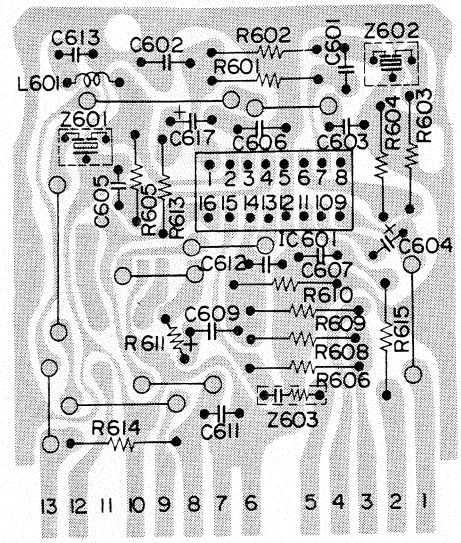
PICTURE I-F MODULE WIRING DIAGRAM

BOTTOM (FOIL) SIDE (FM102D)



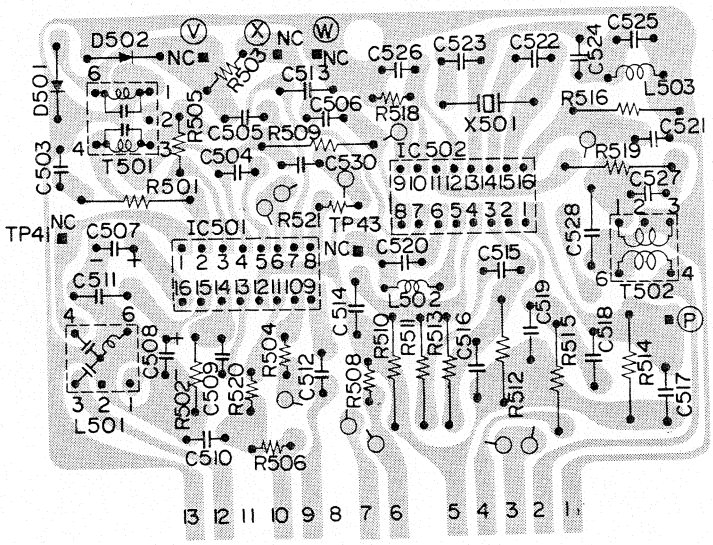
SOUND MODULE WIRING DIAGRAM

BOTTOM (FOIL) SIDE (FM602C)



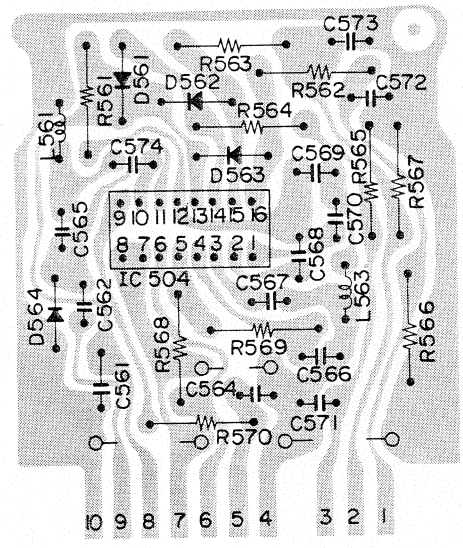
CHROMA MODULE WIRING DIAGRAM

BOTTOM (FOIL) SIDE (FM502C)



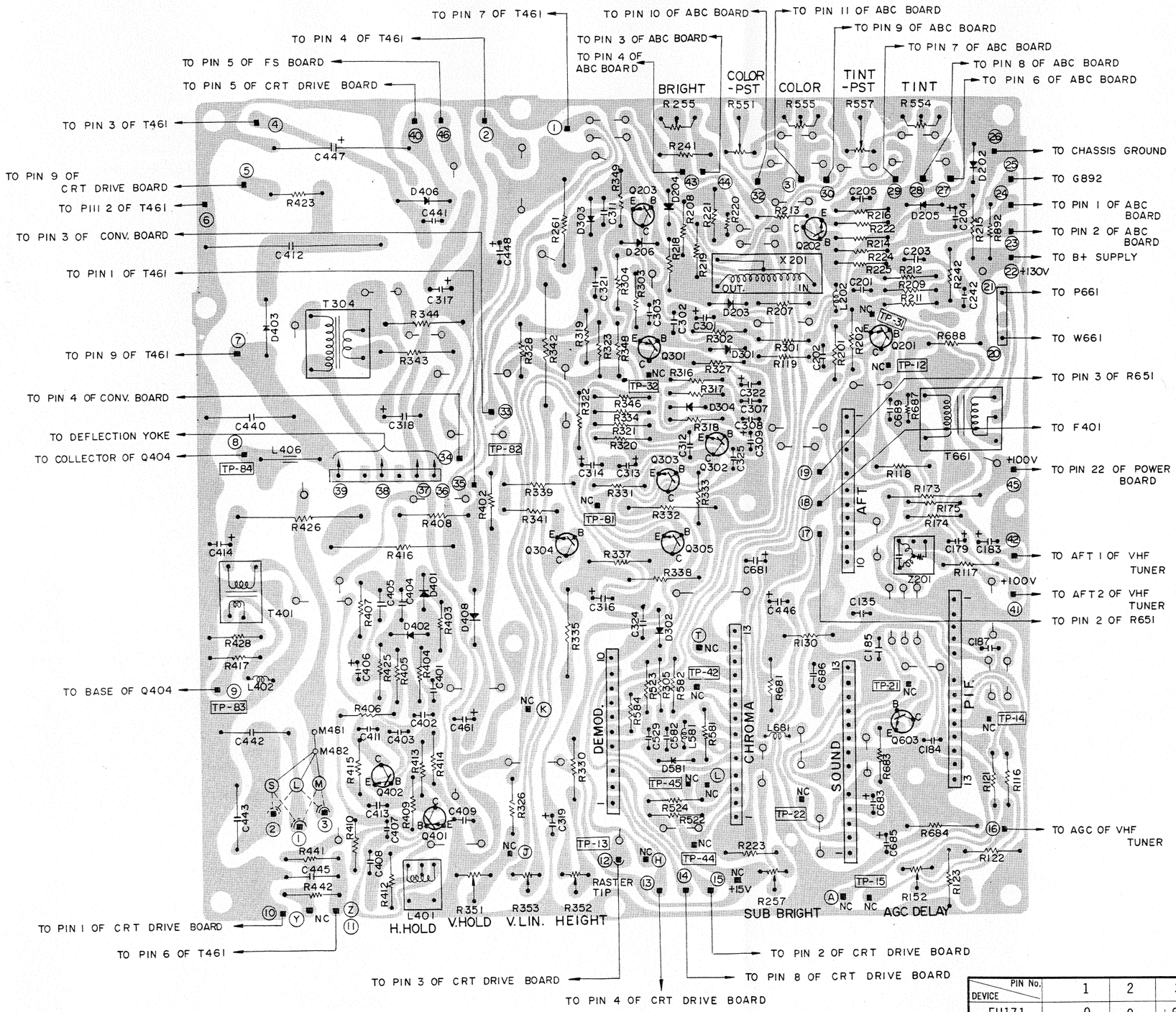
DEMOD. MODULE WIRING DIAGRAM

BOTTOM (FOIL) SIDE (FM554)



PIN No. / DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC 101	+4v	+4v	+8v	0	+12.5v	+12.5v	+12.5v									
IC 102	0	+1.5v	0	+1.5v	+12.5v	+1.5v	+3v	0	+9v	+9v	+1v	+8v	+8v	+11v	+11v	+7.5v
IC 501	+2v	+2v	+15v	0	+2v	+0.6v	+1.5v	+14.5v	+12v	+3v	+8v	+15v	+10v	+7v	+7.5v	+8.5v
IC 502	+11v	+14v	+12v	+12v	+2.5v	+3v	+15v	+2.5v	+0.6v	0	+5v	+1.5v	+3v	+15v	+14.5v	+3v
IC 504	+6v	+6v	+6v	+4v	+4v	+4v	0	0	+5v	+1v	+1v	+12v	+15v	+10v	+10v	+10v
IC 601	+4v	+2v	+2v	+2v	0	+1.5v	+4v	+9v	+8v	+2v	+0·9v	0	+3v	+1v	+7v	+13v

MOTHER BOARD WIRING DIAGRAM BOTTOM (FOIL) SIDE (PW1009)

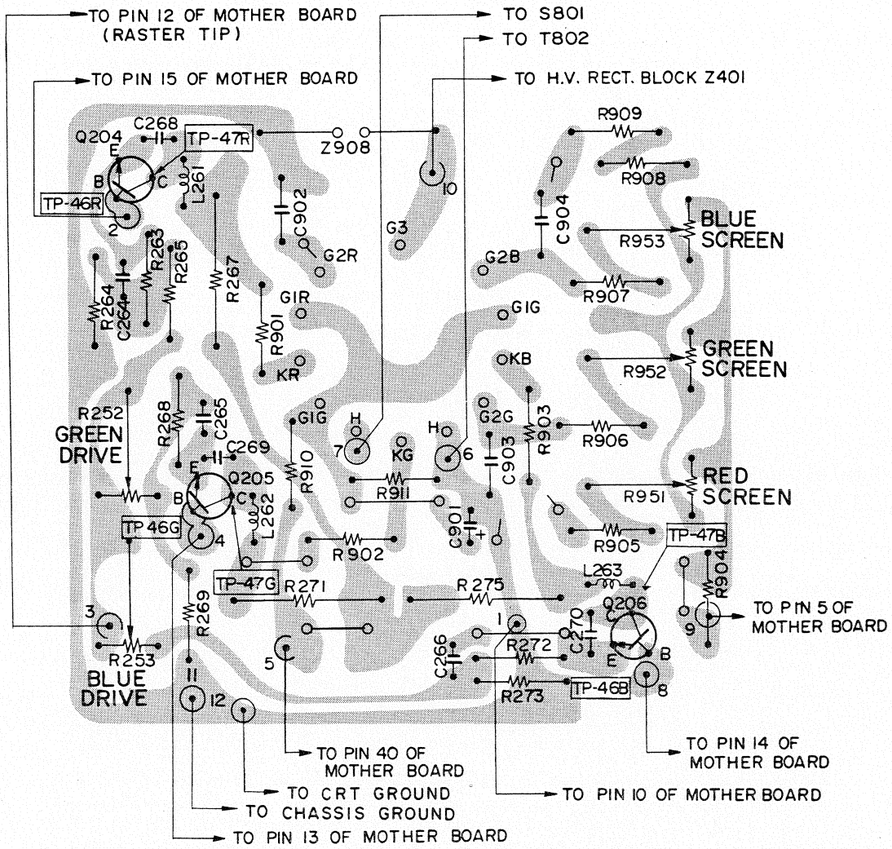


PIN No. / DEVICE	E	B	C
Q201	+3.5v	+3v	0
Q202	+1.5v	+2v	+9v
Q203	+8.5v	+9v	0
Q301	+13v	+13.5v	+2v
Q302	0	−0.2v	+1.5v
Q303	+1v	+1.5v	+14.5v
Q304	+43v	+44v	+90v
Q305	+0.5v	+1v	+42v
Q401	+12.5v	+12v	+3.5v
Q402	0	+0.3v	+70v
Q603	+6v	+13.5v	+13v

PIN No. / DEVICE	1	2	3	4	5	6	7	8	9	10
FU171	0	0	+6.2v	0	+6.2v	0	+11v	0	+12v	0

CRT DRIVE BOARD WIRING DIAGRAM

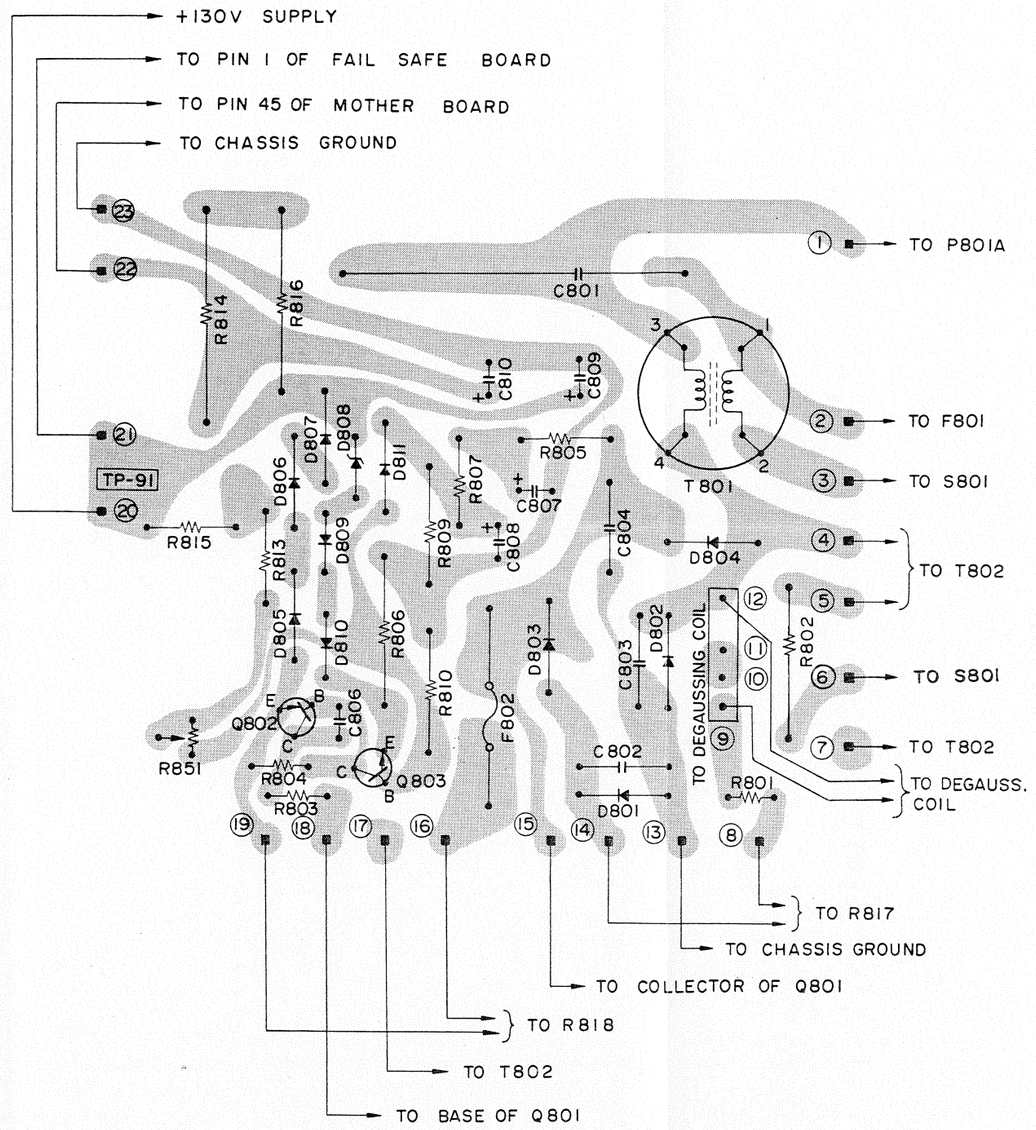
BOTTOM (FOIL) SIDE (PW1011)



PIN No. / DEVICE	E	B	C
Q204	+9v	+9.5v	+110v
Q205	+9v	+9.5v	+110v
Q206	+9v	+9.5v	+110v

POWER BOARD WIRING DIAGRAM

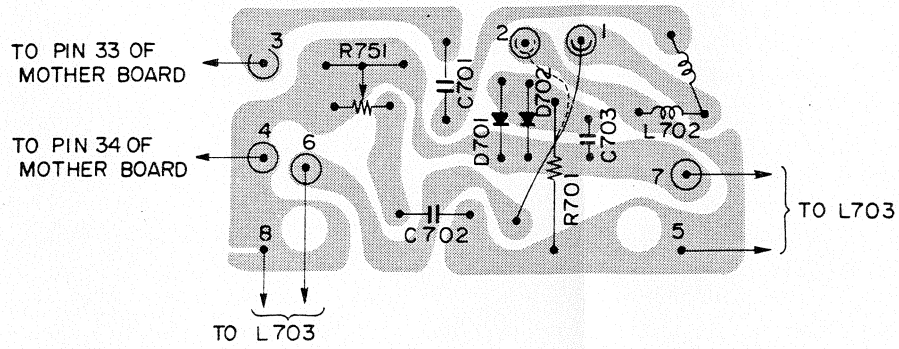
BOTTOM (FOIL) SIDE (PW1012A, PW1012B)



PIN No. / DEVICE	E	B	C
Q802	+132v	+132v	+131v
Q803	+123v	+123v	+132v

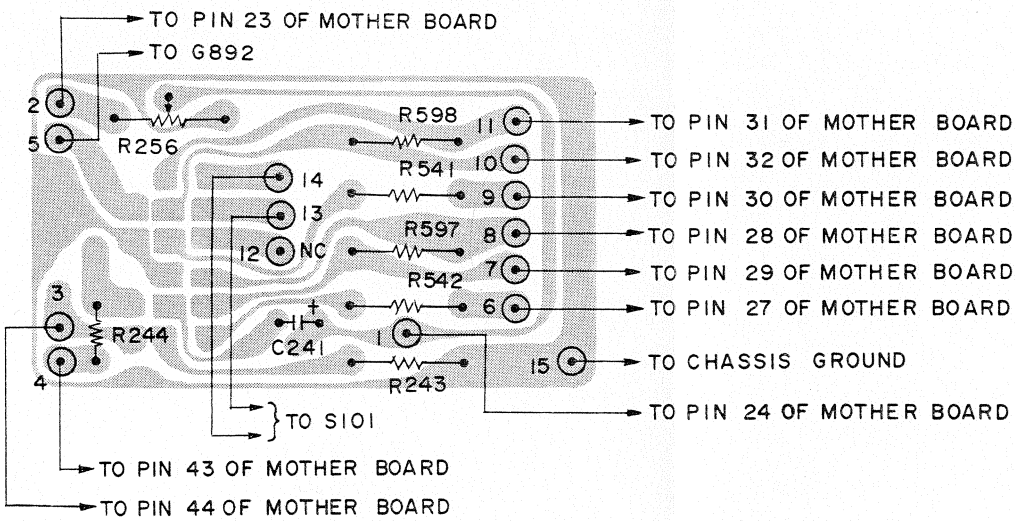
CONVERGENCE BOARD WIRING DIAGRAM

BOTTOM (FOIL) SIDE (PW1010)



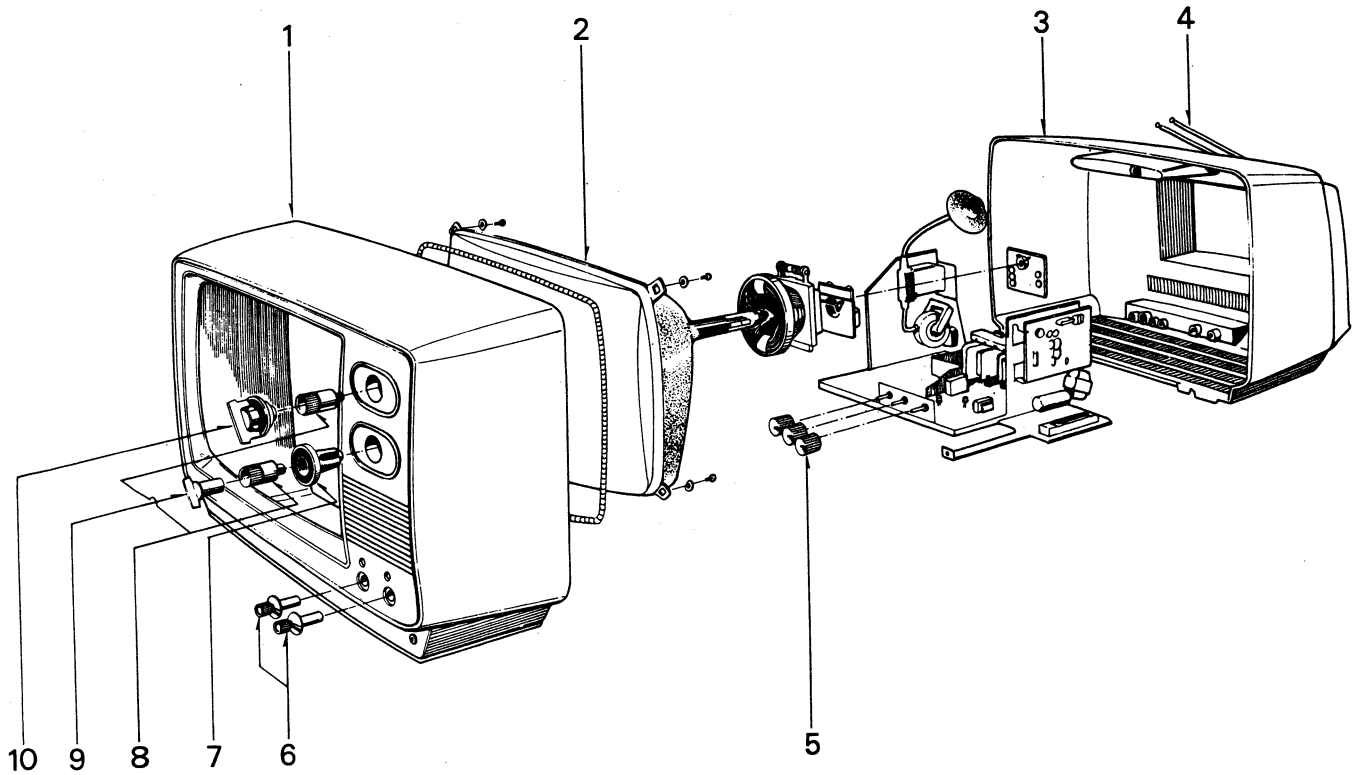
ABC BOARD WIRING DIAGRAM

BOTTOM (FOIL) SIDE (PW1013)



CABINET EXPLODED VIEW AND REPAIR PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

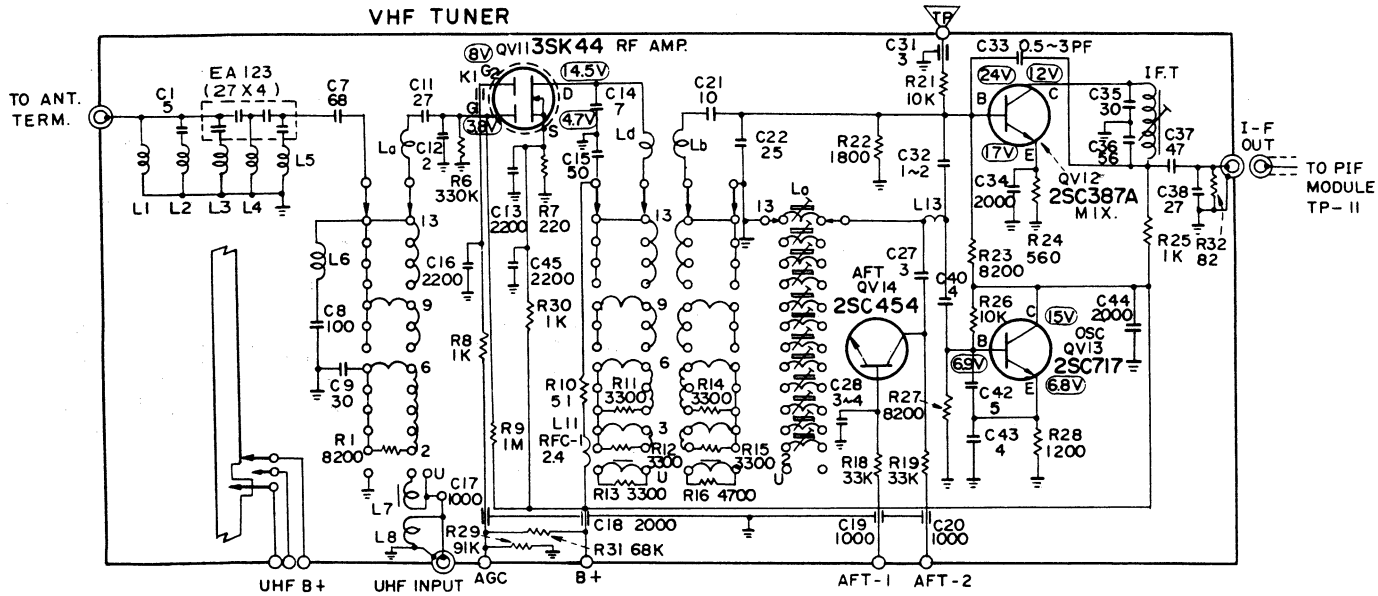


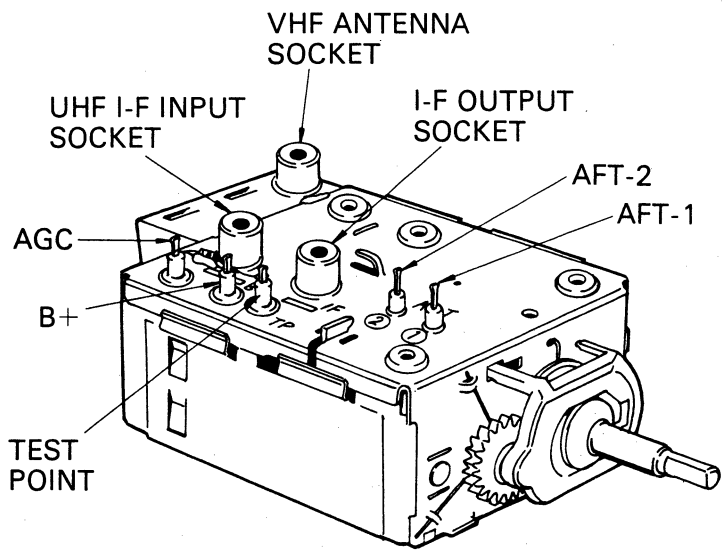
Key No.	Part No.	Description
1	23829779	Cabinet Front (White—C355)
	23829646	Cabinet Front (Red—C355)
	23829645	Cabinet Front (Yellow—C355)
	23829644	Cabinet Front (White—C355C)
	23829648	Cabinet Front (Red—C355C)
	23829649	Cabinet Front (Yellow—C355C)
	23035412	Self-Tapping Screw, 4×12mm, Chassis Assembly Mounting (1 used)
2	23112222	Picture Tube, Type 370AUB22
	23035518	Self-Tapping Screw, 5×18mm, CRT Mounting (4 used)
3	23819502	Rear Cover (White—C355)
	23819394	Rear Cover (Red—C355)
	23819393	Rear Cover (Yellow—C355)
	23819575	Rear Cover (White—C355C)
	23819396	Rear Cover (Red—C355C)
	23819395	Rear Cover (Yellow—C355C)
	23035412	Self-Tapping Screw, 4×12mm, Rear Cover Mounting (5 used)
	23779002	Screw, 3×0.5×12mm, Antenna Terminal Board Mounting (2 used)

Key No.	Part No.	Description
4	23124076	Antenna, VHF Telescoping (2 used)
	23774308	Screw, 3×0.5×8mm, VHF Antenna Mounting (4 used)
	23142339	Antenna Balun Trans. Assembly
5	23826791	Knob, TINT, COLOR and BRIGHTNESS (White) (2 used)
	23826792	Knob, TINT, COLOR and BRIGHTNESS (Red) (2 used)
	23826784	Knob, TINT, COLOR and BRIGHTNESS (Yellow) (2 used)
6	23826119	Knob, PULL-ON/VOLUME/ECONOWATT and PULL-ABC/CONTRAST (3 used)
7	23833961	Dial, UHF
8	23826846	Knob, VHF and UHF FINE TUNING
9	23826813	Knob, UHF CHANNEL
10	23826811	Knob, VHF CHANNEL
	23124050	Antenna, UHF, Loop
	23176067	Power Cord (C355)
	23176200	Power Cord (C355C)
	23152007	Earphone
	23815979	Swivel Base (White)
	23815861	Swivel Base (Red)
	28815860	Swivel Base (Yellow)
	———	Owner's Guidebook

VHF TUNER INFORMATION
(Type No. KL411MX2)

WARNING : BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.



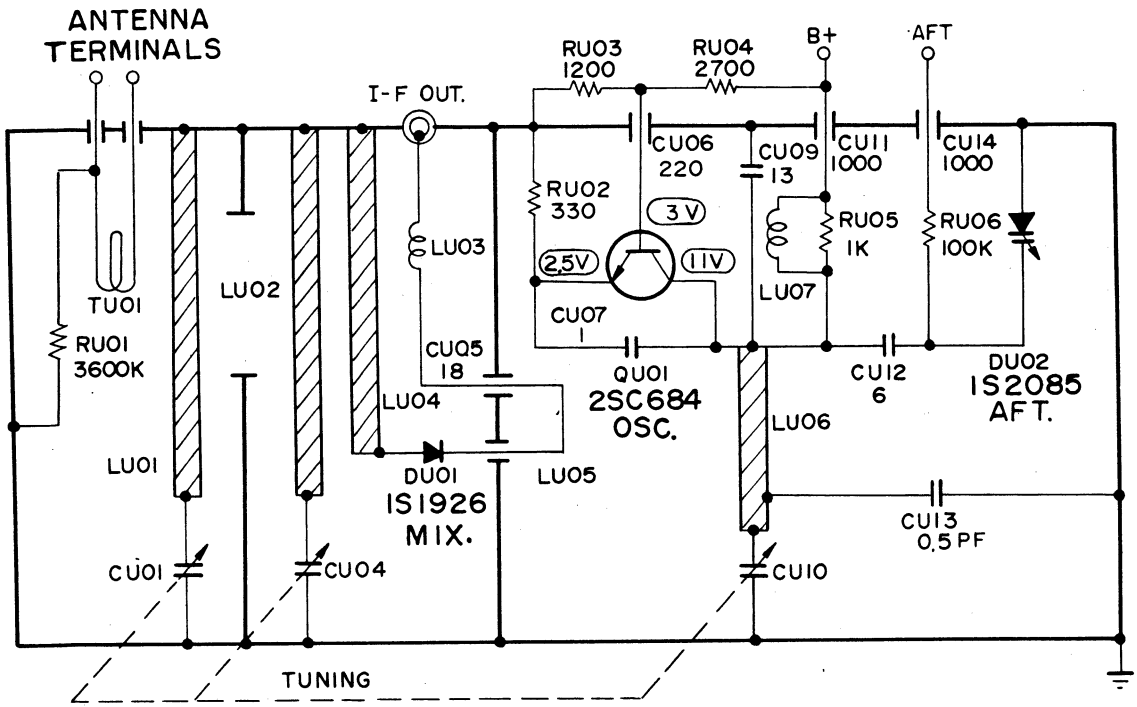


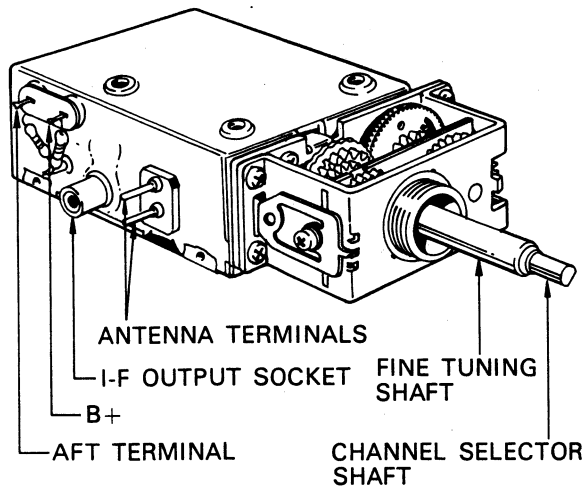
VHF TUNER REPAIR PARTS LIST

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
H002	23121959	VHF Tuner KL411MX2
QV11	23114270	MOS-FET. 3SK44, R-F Amp.
QV12	23114356	NPN Transistor, 2SC387A, Mixer
QV13	23114341	NPN Transistor, 2SC717, OSC.
QV14	23114342	NPN Transistor, 2SC454, AFT

UHF TUNER INFORMATION
(Type No. UT351EA)

WARNING : BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.



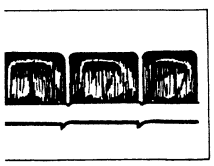


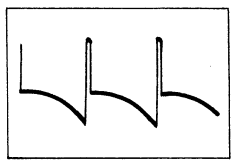
UHF TUNER REPAIR PARTS LIST

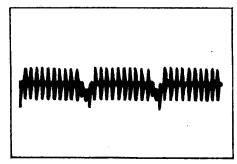
SCHEMATIC LOCATION	PART NO.	DESCRIPTION
H001	23121981	UHF Tuner, UT351EA
QU01	23126620	NPN Transistor, 2SC684, OSC.
DU01	23115972	Diode, 1S1926, Mixer
DU02	23126622	Diode, 1S2085, AFT.

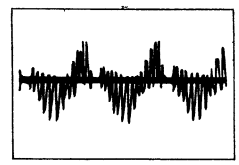
STANDARD WAVEFORMS

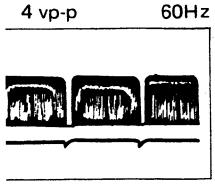
All waveforms are taken using a wideband oscilloscope with a low capacity probe.
The TINT, COLOR and CONTRAST Controls are set to mid-positions, and BRIGHTNESS Control is set to maximum.
Waveforms 1 through 12 are taken with an air signal and 13 through 24 are taken using a color bar generator.
The COLOR AMP. Control of the color bar generator is set to obtain 0.1v P-P deflection on oscilloscope when observing waveform number 13.

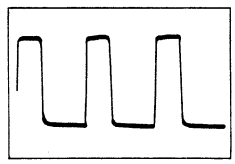

4 vp-p 60Hz

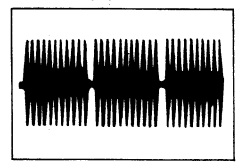

7 80 vp-p 60Hz

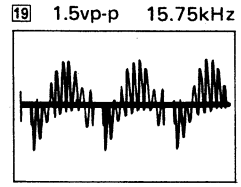

13 0.1 vp-p 15.75kHz

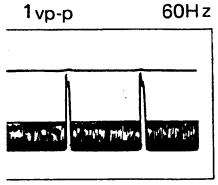

19 1.5vp-p 15.75kHz

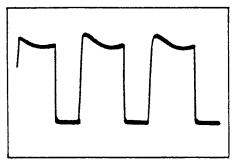

1vp-p 60Hz

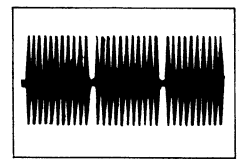

8 0.8 vp-p 15.75kHz

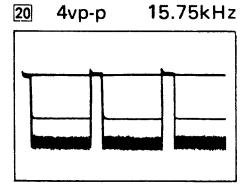

14 0.6vp-p 15.75kHz

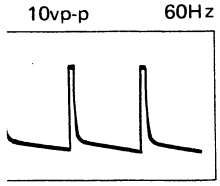

20 4vp-p 15.75kHz

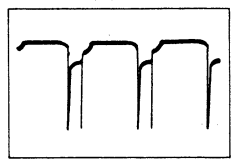

10vp-p 60Hz

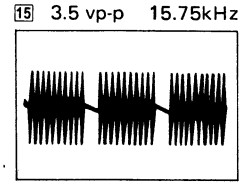

9 130 vp-p 15.75kHz

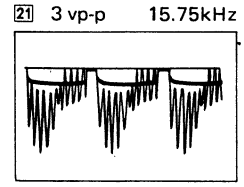

15 3.5 vp-p 15.75kHz

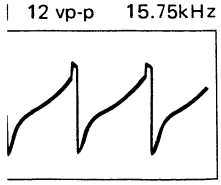

21 3 vp-p 15.75kHz


12 vp-p 15.75kHz

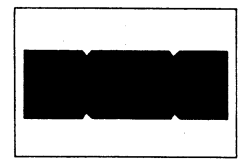

10 12vp-p 15.75kHz

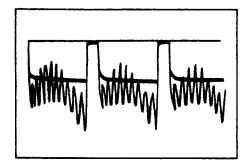

16 0.4vp-p 15.75kHz

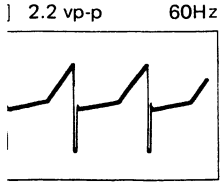

22 100vp-p 15.75kHz

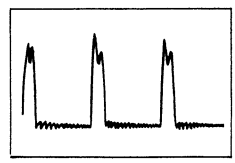

2.2 vp-p 60Hz

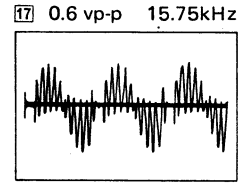
11 900 vp-p 15.75kHz

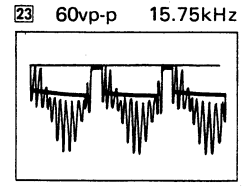

17 0.6 vp-p 15.75kHz


23 60vp-p 15.75kHz

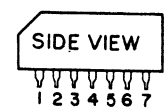

2.5vp-p 60Hz


12 60 vp-p 15.75kHz

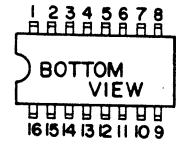

18 4 vp-p 15.75kHz


24 80vp-p 15.75kHz

TERMINAL VIEWS OF SEMICONDUCTORS

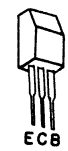


TA7124P

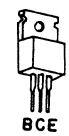


TA7145P
TA7146P
TA7148P
TA7149P
TA7150P

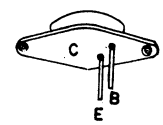
2SA495
2SA562
2SC372
2SC735



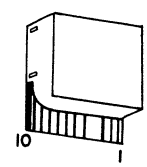
2SA509



2SC1447
2SC1448A
2SC1569

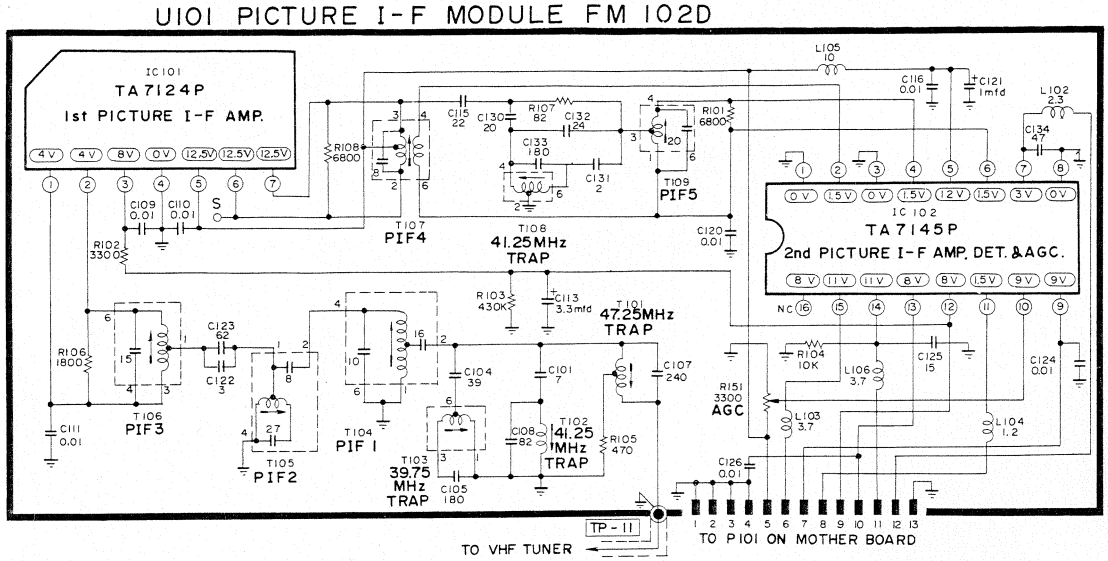


2SC792
2SC1170B

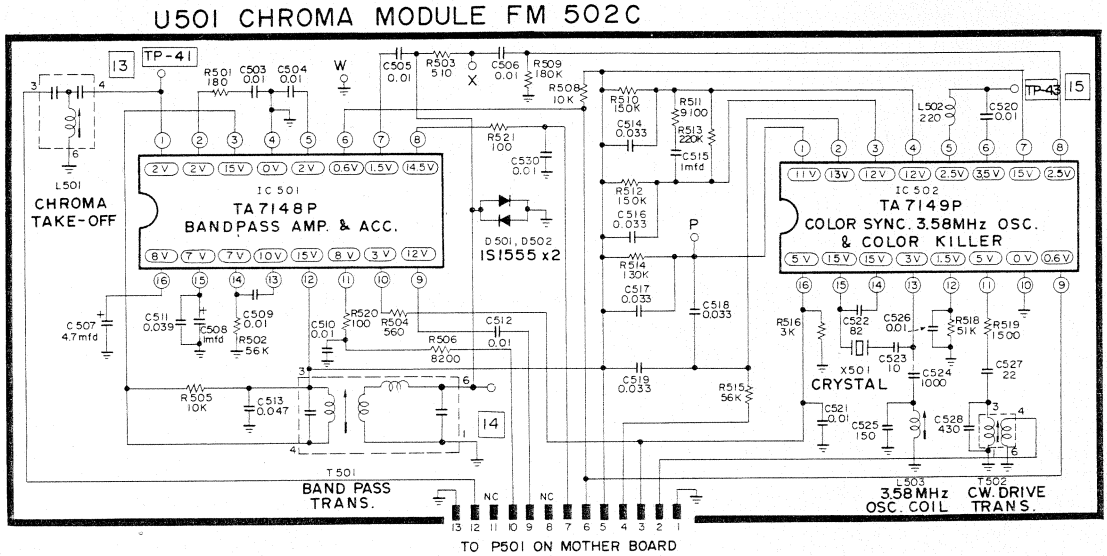


TF9502P

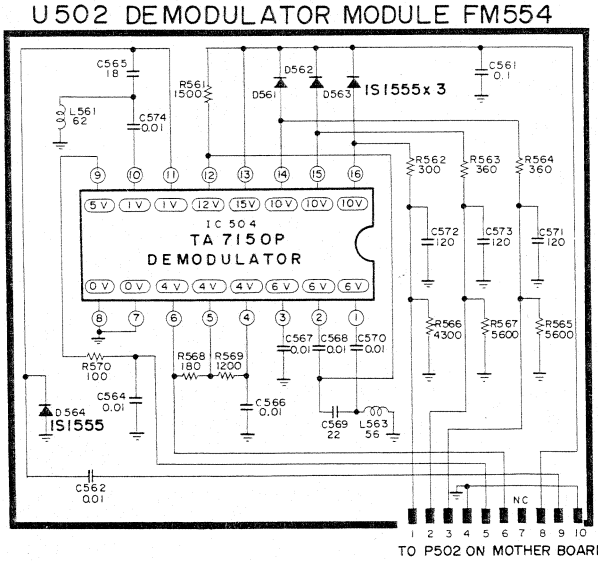
U101 PICTURE I-F MODULE FM 102D



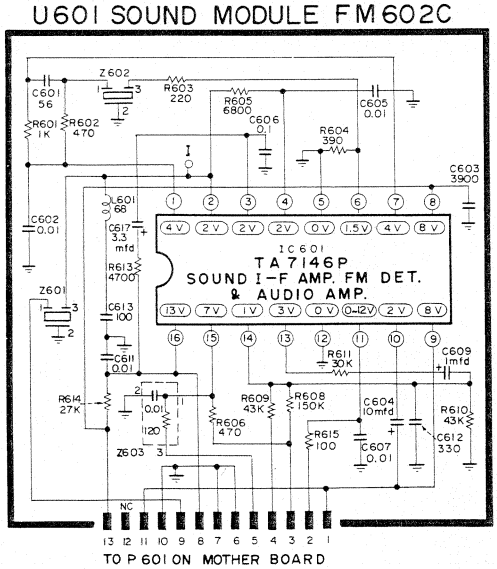
U501 CHROMA MODULE FM 502C



U502 DEMODULATOR MODULE FM554



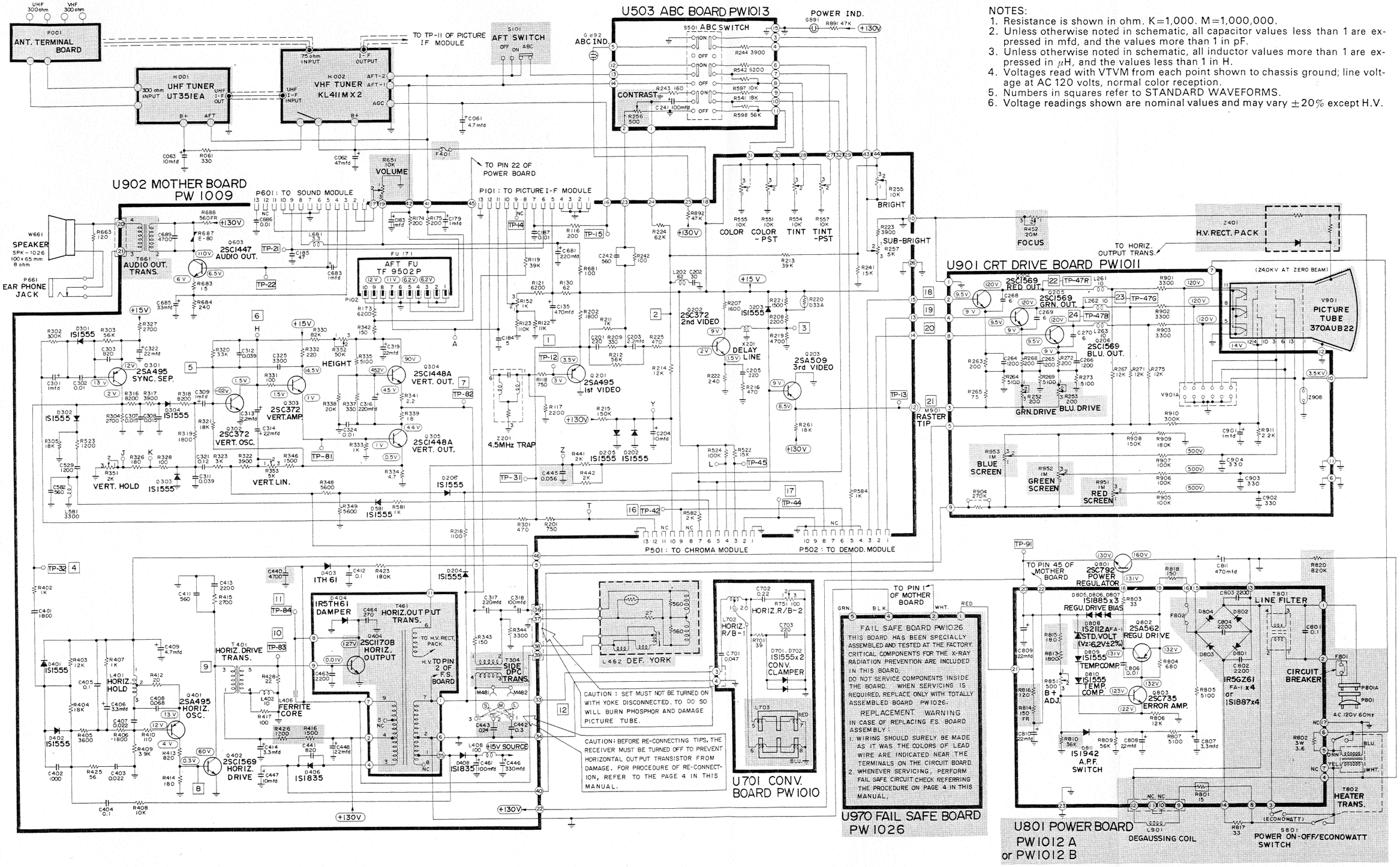
U601 SOUND MODULE FM602C



WARNING : BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

CAUTION : The shaded areas in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 2. Do not degrade the safety of the receiver through improper servicing.

NOTES:
1. Resistance is shown in ohm. K=1,000. M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in mfd, and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.
4. Voltages read with VTVM from each point shown to chassis ground; line voltage at AC 120 volts, normal color reception.
5. Numbers in squares refer to STANDARD WAVEFORMS.
6. Voltage readings shown are nominal values and may vary $\pm 20\%$ except H.V.


U902 MOTHER BOARD PW1009
U503 ABC BOARD PW1013
U901 CRT DRIVE BOARD PW1011
U970 FAIL SAFE BOARD PW1026
U701 CONV. BOARD PW1010
U801 POWER BOARD PW1012 A or PW1012 B
ANT. TERMINAL BOARD
UHF TUNER UT351EA
VHF TUNER KL41IMX2
AFT SWITCH
ABC SWITCH
CONTRAST
VOLUME
COLOR
COLOR -PST
TINT
TINT -PST
BRIGHT
SUB-BRIGHT
FOCUS
SPEAKER
EAR PHONE JACK
AUDIO OUT. TRANS.
2SC1447 AUDIO OUT.
AFT FU TF 9502P
2SC1448A VERT. OUT.
2SC372 VERT. AMP.
2SC372 VERT. OSC.
2SA495 SYNC. SEP.
HEIGHT
VERT. HOLD
VERT. LIN.
2SA495 HORIZ. OSC.
2SC1569 HORIZ. DRIVE
IR5TH61 DAMPER
2SC1170B HORIZ. OUTPUT
HORIZ. OUTPUT TRANS.
HORIZ. DRIVE TRANS.
HORIZ. HOLD
FERRITE CORE
L462 DEF. YORK
T304 SIDE DPC TRANS.
2SC372 2nd VIDEO
X201 DELAY LINE
2SA509 3rd VIDEO
2SA495 1st VIDEO
4.5MHz TRAP
2SC1569 RED OUT.
2SC1569 GRN. OUT.
2SC1569 BLU. OUT.
GRN.DRIVE
BLU. DRIVE
RASTER TIP
BLUE SCREEN
GREEN SCREEN
RED SCREEN
H.V.RECT. PACK
V901 PICTURE TUBE 370AUB22
2SC792 POWER REGULATOR
REGU. DRIVE BIAS
STD.VOLT (Vz:6.2V±2%)
REGU. DRIVE
TEMPCOMP.
TEMP. COMP.
2SC735 ERROR AMP.
B+ ADJ.
A.P.F. SWITCH
LINE FILTER
CIRCUIT BREAKER
HEATER TRANS.
POWER ON-OFF/ECONOWATT SWITCH
DEGAUSSING COIL
FAIL SAFE BOARD PW1026
THIS BOARD HAS BEEN SPECIALLY ASSEMBLED AND TESTED AT THE FACTORY. CRITICAL COMPONENTS FOR THE X-RAY RADIATION PREVENTION ARE INCLUDED IN THIS BOARD.
DO NOT SERVICE COMPONENTS INSIDE THE BOARD. WHEN SERVICING IS REQUIRED, REPLACE ONLY WITH TOTALLY ASSEMBLED BOARD PW1026.
REPLACEMENT WARNING
IN CASE OF REPLACING F.S. BOARD ASSEMBLY:
1. WIRING SHOULD SURELY BE MADE AS IT WAS. THE COLORS OF LEAD WIRE ARE INDICATED NEAR THE TERMINALS ON THE CIRCUIT BOARD.
2. WHENEVER SERVICING, PERFORM FAIL SAFE CIRCUIT CHECK REFERRING THE PROCEDURE ON PAGE 4 IN THIS MANUAL.
CAUTION : SET MUST NOT BE TURNED ON WITH YOKE DISCONNECTED. TO DO SO WILL BURN PHOSPHOR AND DAMAGE PICTURE TUBE.
CAUTION: BEFORE RE-CONNECTING TIPS, THE RECEIVER MUST BE TURNED OFF TO PREVENT HORIZONTAL OUTPUT TRANSISTOR FROM DAMAGE. FOR PROCEDURE OF RE-CONNECTION, REFER TO THE PAGE 4 IN THIS MANUAL.
P001 ANT. TERMINAL BOARD
P501 : TO CHROMA MODULE
P502 : TO DEMOD. MODULE
P601 : TO SOUND MODULE
P101 : TO PICTURE I-F MODULE
TO TP-11 OF PICTURE IF MODULE
TO PIN 22 OF POWER BOARD
TO PIN 45 OF MOTHER BOARD
TO PIN 1 OF MOTHER BOARD
TO HORIZ. OUTPUT TRANS.
+130V
+15V
+15V SOURCE

CHASSIS PARTS LIST

Model C355 Chassis No. TAC520
Model C355C Chassis No. TAC535

WARNING : BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

CAUTION : The shaded areas in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 2. Do not degrade the safety of the receiver through improper servicing.

ABBREVIATIONS: Capacitors·····CD: Ceramic Disk, PF: Plastic Film, EL: Electrolytic or Aluminum Solid
Resistors·····CF: Carbon Film, CC: Carbon Composition, OMF: Oxide Metal Film, VR: Variable Resistor

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
PICTURE I-F MODULE		
CAPACITORS		
C101	24436070	CD, 7pf, ±0.25pf, 50v
C104	24436390	CD, 39pf, 5%, 50v
C105, C133	24355181	CD, 180pf, 5%, 50v
C107	24355241	CD, 240pf, 5%, 50v
C108	24356820	CD, 82pf, 5%, 50v
C109, C110, C111, C116, C120, C124, C126	24232103	CD, 0.01mfd, +80%, −20%, 50v
C113	24088027	EL, 3.3mfd, 16v
C115	24436220	CD, 22pf, 5%, 50v
C121	24636010	EL, 1mfd, 50v
C122	24436030	CD, 3pf, ±0.25pf, 50v
C123	24436620	CD, 62pf, 5%, 50v
C125	24436150	CD, 15pf, 5%, 50v
C130	24436200	CD, 20pf, 5%, 50v
C131	24436020	CD, 2pf, ±0.25pf, 50v
C132	24436240	CD, 24pf, 5%, 50v
C134	24436470	CD, 47pf, 5%, 50v
RESISTORS		
R101, R108	24927682	CF, 6800 ohm, 5%, 1/8w
R102	24927332	CF, 3300 ohm, 5%, 1/8w
R103	24927434	CF, 430k ohm, 5%, 1/8w
R104	24927103	CF, 10k ohm, 5%, 1/8w
R105	24927471	CF, 470 ohm, 5%, 1/8w
R106	24927182	CF, 1800 ohm, 5%, 1/8w
R107	24927820	CF, 82 ohm, 5%, 1/8w
R151	24061137	VR, 3300 ohm, 0.15w, AGC
SEMICONDUCTORS		
IC101	23119981	IC, TA7124P, FA-2, Picture I-F Amp.
IC102	23119989	IC, TA7145P, Picture I-F Amp., DET. AGC
COILS AND TRANSFORMERS		
L102	23261052	Coil, Choke, 2.3μh, AZ9246F
L103, L106	23261051	Coil, Choke, 3.7μh, AZ9246E
L104	23261054	Coil, Choke, 1.2μh, AZ9246H
L105	23261053	Coil, Choke, 10μh, AZ9246G
T101	23262979	Trans., TRF1207, 47.25MHz, Trap
T102	23262988	Trans., TRF1013, 41.25MHz, Trap
T103	23262987	Trans., TRF1014, 39.75MHz Trap
T104	23262928	Trans., TRF1212, PIF-1
T105	23262927	Trans., TRF1213, PIF-2
T106	23262926	Trans., TRF1214, PIF-3
T107	23262925	Trans., TRF1215, PIF-4
T108	23262224	Trans., TRF1003, 41.25MHz Trap
T109	23262924	Trans., TRF1216, PIF-5
MISCELLANEOUS PARTS		
IC101A	23116949	IC Socket, 7P, SIP
IC102A	23116947	IC Socket, 16P, DIP

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
CHROMA MODULE		
CAPACITORS		
C503, C504, C505, C506, C509, C510, C512, C520, C521, C526, C530	24232103	CD, 0.01mfd, +80%, −20%, 50v
C507	24635479	EL, 4.7mfd, 35v
C508	24088024	EL, 1mfd, 16v
C511	24868393	PF, 0.039mfd, 10%, 50v
C513	24868473	PF, 0.047mfd, 10%, 50v
C514, C516, C517, C518, C519	24868333	PF, 0.033mfd, 10%, 50v
C515	24085031	EL, 1mfd, 25v
C522	24436820	CD, 82pf, 5%, 50v
C523	24340100	CD, 10pf, ±0.25pf, 50v
C524	24212102	CD, 1000pf, 10%, 50v
C525	24359151	CD, 150pf, 5%, 50v
C527	24436220	CD, 22pf, 5%, 50v
C528	24357431	CD, 430pf, 5%, 50v
RESISTORS		
R501	24917181	CF, 180 ohm, 5%, 1/8w
R502	24927563	CF, 56k ohm, 5%, 1/8w
R503	24927511	CF, 510 ohm, 5%, 1/8w
R504	24927561	CF, 560 ohm, 5%, 1/8w
R505, R508	24927103	CF, 10k ohm, 5%, 1/8w
R506	24927822	CF, 8200 ohm, 5%, 1/8w
R509	24917184	CF, 180k ohm, 5%, 1/8w
R510, R512	24801154	CF, 150k ohm, 2%, 1/8w
R511	24917912	CF, 9100 ohm, 5%, 1/8w
R513	24917224	CF, 220k ohm, 5%, 1/8w
R514	24801134	CF, 130k ohm, 2%, 1/8w
R515	24801563	CF, 56k ohm, 2%, 1/8w
R516	24917302	CF, 3k ohm, 5%, 1/8w
R518	24927513	CF, 51k ohm, 5%, 1/8w
R519	24917152	CF, 1500 ohm, 5%, 1/8w
R520, R521	24927101	CF, 100 ohm, 5%, 1/8w
SEMICONDUCTORS		
IC501	23119995	IC, TA7148P, Bandpass Amp.
IC502	23119994	IC, TA7149P, Color Sync., OSC, Killer
D501, D502	23115285	Diode, IS1555
COILS AND TRANSFORMERS		
L501	23274993	Coil, TRF5010, Chroma Take-off
L502	23283221	Coil, Peaking, 220μh, TRF4221J
L503	23272995	Coil, TRF5002B, 3.58MHz, Osc.
T501	23274998	Trans., TRF5008, Bandpass
T502	23275997	Trans., TRF5001A, C.W. Driver

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SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
MISCELLANEOUS PARTS		
IC501A, IC502A	23116947	IC Socket, 16P, DIP
X501	23153004	3.58MHz Crystal Resonator
DEMODULATOR MODULE		
CAPACITORS		
C561	24602104	PF, 0.1mfd, 10%, 50v
C562, C564, C566, C567, C568, C570, C574	24232103	CD, 0.01mfd, +80%, −20%, 50v
C565	24436180	CD, 18pf, 5%, 50v
C569	24436220	CD, 22pf, 5%, 50v
C571, C572, C573	24436121	CD, 120pf, 5%, 50v
RESISTORS		
R561	24917152	CF, 1500 ohm, 5%, 1/8w
R562	24917301	CF, 300 ohm, 5%, 1/8w
R563, R564	24917361	CF, 360 ohm, 5%, 1/8w
R565, R567	24917562	CF, 5600 ohm, 5%, 1/8w
R566	24917432	CF, 4300 ohm, 5%, 1/8w
R568	24917181	CF, 180 ohm, 5%, 1/8w
R569	24917122	CF, 1200 ohm, 5%, 1/8w
R570	24917101	CF, 100 ohm, 5%, 1/8w
SEMICONDUCTORS		
IC504	23119993	IC, TA7150P, Demodulator
D561, D562, D563, D564	23115285	Diode, IS1555
COILS		
L561	23283620	Coil, Peaking, 62μh, TRF4620J
L563	23252458	Coil, Peaking, 56μh, TRF4560G
MISCELLANEOUS PARTS		
IC504A	23116947	IC Socket, 16P, DIP
SOUND MODULE		
CAPACITORS		
C601	24355560	CD, 56pf, 5%, 50v
C602, C605, C607, C611	24232103	CD, 0.01mfd, +80%, −20%, 50v
C603	24602392	PF, 3900pf, 10%, 50v
C604	24633100	EL, 10mfd, 16v
C606	24602104	PF, 0.1mfd, 10%, 50v
C609	24636010	EL, 1mfd, 50v
C612	24436331	CD, 330pf, 5%, 50v
C613	24436101	CD, 100pf, 5%, 50v
C617	24088027	EL, 3.3mfd, 16v
RESISTORS		
R601	24917102	CF, 1k ohm, 5%, 1/8w
R602, R606	24917471	CF, 470 ohm, 5%, 1/8w
R603	24917221	CF, 220 ohm, 5%, 1/8w
R604	24917391	CF, 390 ohm, 5%, 1/8w
R605	24941682	CC, 6800 ohm, 5%, 1/4w
R608	24917154	CF, 150k ohm, 5%, 1/8w
R609, R610	24917433	CF, 43k ohm, 5%, 1/8w
R611	24927303	CF, 30k ohm, 5%, 1/8w
R613	24941472	CC, 4700 ohm, 5%, 1/4w
R614	24917273	CF, 27k ohm, 5%, 1/8w
R615	24917101	CF, 100 ohm, 5%, 1/8w

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
SEMICONDUCTOR		
IC601	23119988	IC, TA7146P, Sound I-F Amp. FM Det. & Audio Amp.
COIL		
L601	23283680	Coil, Peaking, 68μh, TRF4680J
MISCELLANEOUS PARTS		
IC601A	23116947	IC Socket, 16P, DIP
Z601	23107001	Ceramic Filter, 4.5MHz, △f: 150kHz
Z602	23100228	Ceramic Filter, 4.5MHz, △f: 180kHz
Z603	23134196	CR Network, 0.01mfd,—120 ohm
CRT DRIVE CIRCUIT BOARD		
CAPACITORS		
C264, C265, C266	24212122	CD, 1200pf, 10%, 50v
C268, C269, C270	24435060	CD, 6pf, ±0.25pf, 500v
C901	24644010	EL, 1mfd, 250v
C902, C903, C904	24210331	CD, 330pf, 20%, 1kv
RESISTORS		
R252, R253	24314201	VR, 200 ohm, 1/2w Green and Blue Drive
R263, R268, R272	24917201	CF, 200 ohm, 5%, 1/8w
R264, R269, R273	24917512	CF, 5100 ohm, 5%, 1/8w
R265	24917750	CF, 75 ohm, 5%, 1/8w
R267, R271, R275	24963123	OMF, 12k ohm, 5%, 1w
R901, R902, R903	24946332	CC, 3300 ohm, 10%, 1/2w
R904	24946274	CC, 270k ohm, 10%, 1/2w
R905, R906, R907	24940104	CC, 100k ohm, 20%, 1/2w
R908	24946154	CC, 150k ohm, 10%, 1/2w
R909	24946184	CC, 180k ohm, 10%, 1/2w
R910	24917304	CF, 300k ohm, 5%, 1/8w
R911	24917223	CF, 22k ohm, 5%, 1/8w
R951, R952, R953	24314105	VR, 1M ohm, 1/2w, Red, Green and Blue Screen
SEMICONDUCTORS		
Q204, Q205, Q206	23114982	NPN Transistor, 2SC1569
COILS		
L261, L262, L263	23261053	Coil, Choke, 10μh, AZ9246G
MISCELLANEOUS PARTS		
V901A	23116953	CRT Socket, 12P
Z908	23140021	Spark Gap, 8kv
MOTHER CIRCUIT BOARD		
CAPACITORS		
C135	24633471	EL, 470mfd, 16v
C179, C183, C301, C683	24636010	EL, 1mfd, 50v
C184	24436050	CD, 5pf, ±0.25pf, 50v
C185	24436470	CD, 47pf, 5%, 50v

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SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
C187	24232103	CD, 0.01mfd, +80%, −20%, 50v
C201, C205	24436221	CD, 220pf, 5%, 50v
C202	24436300	CD, 30pf, 5%, 50v
C203	24085028	EL, 2.2mfd, 25v
C204	24633100	EL, 10mfd, 16v
C242, C582	24212561	CD, 560pf, 10%, 50v
C302, C686	24602103	PF, 0.01mfd, 10%, 50v
C303	24212821	CD, 820pf, 10%, 50v
C307, C308	24692153	PF, 0.015mfd, 5%, 50v
C309	24088055	EL, 1mfd, 16v
C311, C312	24602393	PF, 0.039mfd, 10%, 50v
C313, C314	24088035	EL, 2.2mfd, 16v
C316	24631221	EL, 220mfd, 6.3v
C317, C681	24633221	EL, 220mfd, 16v
C318	24642101	EL, 100mfd, 160v
C319	24642220	EL, 22mfd, 160v
C321	24596124	PF, 0.12mfd, 10%, 100v
C322	24633220	EL, 22mfd, 16v
C324	24229103	CD, 0.01mfd, +100%, −0%, 500v
C325	24602332	PF, 3300pf, 10%, 50v
C401	24602182	PF, 1800pf, 10%, 50v
C402	24602102	PF, 1000pf, 10%, 50v
C403	24602223	PF, 0.022mfd, 10%, 50v
C404, C405	24602104	PF, 0.1mfd, 10%, 50v
C406	24636339	EL, 3.3mfd, 50v
C407	24095449	PF, 0.022mfd, 5%, 50v
C408	24095450	PF, 0.068mfd, 5%, 50v
C409	24088060	EL, 4.7mfd, 25v
C411	24214561	CD, 560pf, 10%, 500v
C412	24099064	Paper, 0.1mfd, 10%, 1500v
C413	24214222	CD, 2200pf, 10%, 500v
C414	24642339	EL, 3.3mfd, 160v
C440	24095257	PF, 4700pf, 5%, 1600v
C441	24214821	CD, 820pf, 10%, 500v
C442	24829304	PF, 0.3mfd, 5%, 400v
C443	24829244	PF, 0.24mfd, 5%, 400v
C445	24833563	PF, 0.056mfd, 10%, 200v
C446	24634331	EL, 330mfd, 25v
C447	24623100	EL, 10mfd, 200v
C448	24622220	EL, 22mfd, 160v
C461	24634101	EL, 100mfd, 25v
C529	24212122	CD, 1200pf, 10%, 50v
C685	24633330	EL, 33mfd, 16v
C689	24229472	CD, 4700pf, +100%, −0%, 500v
RESISTORS		
R116, R174, R175	24917201	CF, 200 ohm, 5%, 1/8w
R117, R208	24917222	CF, 2200 ohm, 5%, 1/8w
R118, R201	24917751	CF, 750 ohm, 5%, 1/8w
R119, R213, R409	24917393	CF, 39k ohm, 5%, 1/8w
R121	24917622	CF, 6200 ohm, 5%, 1/8w
R122	24917113	CF, 11k ohm, 5%, 1/8w
R123	24917114	CF, 110k ohm, 5%, 1/8w
R130	24962620	OMF, 62 ohm, 5%, 1/2w
R152	24061393	VR, 1k ohm, 1/2w, AGC Delay
R173	24964622	OMF, 6200 ohm, 5%, 2w
R202	24919182	CF, 1800 ohm, 5%, 1/4w
R207	24917162	CF, 1600 ohm, 5%, 1/8w
R209	24917331	CF, 330 ohm, 5%, 1/8w

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
R211, R333, R402, R407, R581	24917102	CF, 1k ohm, 5%, 1/8w
R212, R303	24917563	CF, 56k ohm, 5%, 1/8w
R214, R403	24917123	CF, 12k ohm, 5%, 1/8w
R215	24919154	CF, 150k ohm, 5%, 1/4w
R216, R225, R301	24917471	CF, 470 ohm, 5%, 1/8w
R218	24917112	CF, 1100 ohm, 5%, 1/8w
R219	24917472	CF, 4700 ohm, 5%, 1/8w
R220	24000023	Thermistor, D33A
R221, R346	24917152	CF, 1500 ohm, 5%, 1/8w
R222	24917241	CF, 240 ohm, 5%, 1/8w
R223, R317, R322	24917392	CF, 3900 ohm, 5%, 1/8w
R224	24917623	CF, 62k ohm, 5%, 1/8w
R241, R522	24917153	CF, 15k ohm, 5%, 1/8w
R242, R328, R331	24917101	CF, 100 ohm, 5%, 1/8w
R255, R551, R554, R555, R557	24060965	VR, 50k ohm, 1/5w R255: BRIGHTNESS R551: COLOR-PST. R554: TINT R555. COLOR R557: TINT-PST. These five resistors are united in one part
R257, R353	24061888	VR, 5k ohm, 0.3w R257: SUB-BRIGHTNESS R353: VERTICAL LINEARITY
R261	24964183	OMF, 18k ohm, 5%, 2w
R302	24917304	CF, 300k ohm, 5%, 1/8w
R304, R327	24917272	CF, 2700 ohm, 5%, 1/8w
R305, R321, R404	24917183	CF, 18k ohm, 5%, 1/8w
R316, R318	24917822	CF, 8200 ohm, 5%, 1/8w
R319, R406	24917182	CF, 1800 ohm, 5%, 1/8w
R320	24917333	CF, 33k ohm. 5%, 1/8w
R323	24917302	CF, 3k ohm, 5%, 1/8w
R326, R414	24917181	CF, 180 ohm. 5%, 1/8w
R330	24919823	CF, 82k ohm, 5%, 1/4w
R332	24964221	OMF, 220 ohm, 5%, 2w
R334	24982479	Metal Film, 4.7 ohm, 5%, 1/2w
R335	24964512	OMF, 5100 ohm, 5%, 2w
R337	24919331	CF, 330 ohm, 5%, 1/4w
R338	24963203	OMF, 20k ohm, 5%, 1w
R339	24963180	OMF, 18 ohm, 5%, 1w
R341	24982229	Metal Film, 2.2 ohm, 5%, 1/2w
R342	24965151	OMF, 150 ohm, 5%, 3w
R343	24963151	OMF, 150 ohm, 5%, 1w
R344	24963332	OMF, 3300 ohm, 5%, 1w
R348, R349	24917562	CF, 5600 ohm, 5%, 1/8w
R351	24061100	VR, 2k ohm, 1/5w, Vertical Hold
R352	24061885	VR, 50k ohm, 0.3w, Vertical Height
R405	24917362	CF, 3600 ohm, 5%, 1/8w
R408	24921103	CF, 10k ohm, 5%, 1/2w
R410	24917111	CF, 110 ohm, 5%, 1/8w
R412	24917200	CF, 20 ohm, 5%, 1/8w
R413	24917821	CF, 820 ohm, 5%, 1/8w
R415	24946272	CC, 2700 ohm, 10%, 1/2w
R416	24965152	OMF, 1500 ohm, 5%, 3w
R417	24946101	CC, 100 ohm, 10%, 1/2w
R423	24942184	CC, 180k ohm, 5%, 1/2w

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SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
R425	24917560	CF, 56 ohm, 5%, 1/8w
R426	24965122	OMF, 1200 ohm, 5%, 3w
R428	24946220	CC, 22 ohm, 10%, 1/2w
R441, R442, R582	24917202	CF, 2k ohm, 5%, 1/8w
R523	24917122	CF, 1200 ohm, 5%, 1/8w
R524	24801104	CF, 100k ohm, 2%, 1/8w
R584	24941102	CC, 1k ohm, 5%, 1/4w
R681	24942101	CC, 100 ohm, 5%, 1/2w
R683	24917150	CF, 15 ohm, 5%, 1/8w
R684	24963241	OMF, 240 ohm, 5%, 1w
R687	24000097	Varistor, E-80
R688	24531561	Fusible, 560 ohm, 5%, 1/2w
R892	24946473	CC, 47k ohm, 10%, 1/2w
SEMICONDUCTORS		
Q201	23114301	PNP Transistor, 2SA495-O
Q202, Q302, Q303	23114275	NPN Transistor, 2SC372-O
Q203	23114347	PNP Transistor, 2SA509-O
Q301, Q401	23114302	PNP Transistor, 2SA495-Y
Q304, Q305	23114955	NPN Transistor, 2SC1448A
Q402	23114941	NPN Transistor, 2SC1569, FA-3
Q603	23114954	NPN Transistor, 2SC1447
D202, D203, D204, D205, D206, D301, D302, D303, D304, D401, D402, D581	23115285	Diode, 1S1555
D403	23115966	Diode, 1TH61
D406, D408	23115338	Diode, 1S1835
COILS AND TRANSFORMERS		
L202	23252897	Coil, Peaking, 62μh, TRF4620G
L401	23225699	Coil, Adjust, TLN1023, Horiz. Hold
L402	23221060	Coil, Choke, 10μh, TLN1015E
L406	23261023	Ferrite Core, HC2035
L408	23221026	Coil, Choke, 100μh, AZ9004Y
L581	23283332	Coil, Peaking, 3300μh, TRF4332J
L681	23284339	Coil, Peaking, 3.3μh, TRF4339K
T304	23228994	Trans., TPC2009, Side DPC
T401	23224999	Horiz. Drive Trans., TLN1024
T661	23216984	Trans., TSP1023, Audio Output
MISCELLANEOUS PARTS		
P101, P501, P601	23163164	Module Socket, 13P
P102, P502	23163163	Module Socket, 10P
X201	23250994	Delay Line, TRF2012
Z201	23252130	Network, Video Trap, TRF2005

ABC CIRCUIT BOARD

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
CAPACITOR		
C241	24633101	EL, 100mfd, 16v
RESISTORS		
R243	24917161	CF, 160 ohm, 5%, 1/8w
R244	24917392	CF, 3900 ohm, 5%, 1/8w
R256	24060964	VR, 500 ohm, 1/2w, PULL-ABC/CONTRAST
R541	24917183	CF, 18k ohm, 5%, 1/8w
R542	24917622	CF, 6200 ohm, 5%, 1/8w
R597	24917103	CF, 10k ohm, 5%, 1/8w
R598	24917563	CF, 56k ohm, 5%, 1/8w
MISCELLANEOUS PARTS		
S501	24060964	ABC Switch, included in R256

POWER CIRCUIT BOARD

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
CAPACITORS		
C801	24095359	PF, 0.1mfd, 20%, AC 125v (for Model C355)
	or 24095352	PF, 0.1mfd, 20%, AC 125v (for Model C355C)
C802, C803, C804	24094445	CD, 2200pf, +100%, −0%, AC 125v
C806	24232103	CD, 0.01mfd, +80%, −20%, 50v
C807	24644339	EL, 3.3mfd, 250v
C808	24644229	EL, 2.2mfd, 250v
C809, C810	24642220	EL, 22mfd, 160v
RESISTORS		
R801	24000979	Positive Thermistor, 15 ohm
R802	24027369	Wire-wound, 3.6 ohm, 5%, 3w
R803	24945330	CC, 33 ohm, 10%, 1/4w
R804	24945681	CC, 680 ohm, 10%, 1/4w
R805	24962512	OMF, 5100 ohm, 5%, 1/2w
R806	24964123	OMF, 12k ohm, 5%, 2w
R807	24917512	CF, 5100 ohm, 5%, 1/8w
R809	24963563	OMF, 56k ohm, 5%, 1w
R810	24003998	OMF, 36k ohm, 2%, 1w
R813	24801182	CF, 1800 ohm, 2%, 1/8w
R814	24534151	Fusible, 150 ohm, 5%, 3w
R815	24801181	CF, 180 ohm, 2%, 1/8w
R816	24513121	Cement, 120 ohm, 5%, 3w
R851	24061955	VR, 500 ohm, 1/2w, B+Adj.
SEMICONDUCTORS		
Q802	23114293	PNP Transistor, 2SA562-Y
Q803	23114297	NPN Transistor, 2SC735-Y
D801, D802, D803, D804	23115296	Diode, 1S1887 (for Model C355)
	or 23115947	Diode, 1R5GZ61 FA-1(for Model C355C)
D805, D806, D807	23115263	Diode, 1S1885
D808	23115955	Zener Diode, 1S2112A, FA-1, VZ: 6.2v ±2%
D809, D810	23115285	Diode, 1S1555
D811	23115273	Diode, 1S1942
TRANSFORMER		
T801	23211997	AC Line Filter Trans., TRF3004C
MISCELLANEOUS PARTS		
F802	23144961	Fuse 0.5A
F802A	23165081	Fuse Holder

CONVERGENCE CIRCUIT BOARD

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
CAPACITORS		
C701	24833473	PF, 0.047mfd, 10%, 200v
C702	24602224	PF, 0.22mfd, 10%, 50v
C703	24212221	CD, 220pf, 10%, 50v
RESISTORS		
R701	24963390	OMF, 39 ohm, 5%, 1w
R751	24061259	VR, 100 ohm, 1w, Convergence Adj.

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SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
SEMICONDUCTORS		
D701, D702	23115285	Diode, 1S1555
COILS		
L702	23227168	Coil, Adjust, TCV2005, Convergence
L703	23227722	Convergence Yoke, TCV1006B

COMPONENTS NOT MOUNTED ON CIRCUIT BOARD

CAPACITORS		
C061	24615479	EL, 4.7mfd, 35v
C062	24614470	EL, 47mfd, 25v
C063	24613100	EL, 10mfd, 16v
C463	24212222	CD, 2200pf, 10%, 50v
C464	24442271	CD, 270pf, 10%, 2kv
C811	24087006	EL, 470mfd, 200v
RESISTORS		
R061	24917331	CF, 330 ohm, 5%, 1/8w
R452	24060972	VR, 20M ohm, 1/2w, Focus
R651	24056994	VR, 10k ohm, 1/2w (for Model C355)
	or 24056993	VR, 10k ohm, 1/2w (for Model C355C) PULL-ON/VOLUME/ECONOWATT, includes S801
R663	24946121	CC, 120 ohm, 10%, 1/2w
R817	24007035	Cement, 3.3 ohm, 5%, 15w
R818	24049151	Cement, 150 ohm, 5%, 25w
R820	24946824	CC, 820k ohm, 10%, 1/2w
R891	24946473	CC, 47k ohm, 10%, 1/2w
SEMICONDUCTORS		
Q404	23114962	NPN Transistor, 2SC1170B, FA-2
Q801	23114208	NPN Transistor, 2SC792
D404	23115960	Diode, 1R5TH61
COILS AND TRANSFORMERS		
L462	23227723	Deflection Yoke, TDY2045A
L901	23200990	Degaussing Coil, TSB2047
T461	23226357	Horiz. Output Trans., TFB2025A
T802	23213281	Heater Trans., TPW1015C (for Model C355)
	or 23213284	Heater Trans., TPW1015D (for Model C355C)
MISCELLANEOUS PARTS		
A208	23831861	Rubber Cushion, Speaker Mounting
B107	23873938	Neon Lamp Assembly, Power and ABC Indicator
F401	23144961	Fuse, 0.5A
F401A	23165993	Fuse Holder
F801	23144976	Circuit Breaker, 1.6A, 135v
G891, C892	23113004	Neon Lamp, NE-2C
P001	23142956	Antenna Terminal Board (for Model C355)
	or 23142912	Antenna Terminal Board (for Model C355C)
P661	23163061	Earphone Jack
P801	23176067	Power Supply Cord (for Model C355)
	or 23176200	Power Supply Cord (for Model C355C)
P801A	23164109	Plug, AC Interlock
S101	23145985	Switch, Slide, AFT
S801	24056994	Power ON-OFF Switch (for Model C355)
	or 24056993	Power ON-OFF Switch (for Model C355C) S801 included in R651
W661	23151990	Speaker, SPK-1026, 100×65mm, 8 ohm
Z401	23115952	H.V. Rect. Pack, w/Anode Cap TPA5004C

MODULE UNITS AND CIRCUIT BOARD ASSEMBLIES

FU171	23137997	AFT Functional Unit, TF9502P
U101	23148916	Picture I-F Module, FM102D
U501	23148922	Chroma Module, FM502C
U502	23148915	Demodulator Module, FM554
U503	23149845	ABC Board Assembly, PW1013
U601	23148920	Sound Module, FM602C
U701	23149848	Convergence Board Assembly, PW1010
U801	23149773	Power Board Assembly, PW1012B (for Model C355)
	or 23149809	Power Board Assembly, PW1012A (for Model C355C)
U901	23149847	CRT Drive Board Assembly, PW1011
U902	*NSP	Mother Board Assembly, PW1009
U970	23149835	Fail Safe Board Assembly, PW1026

TUNERS

H001	23121981	UHF Tuner, UT351EA (See page 21 for details)
H002	23121959	VHF Tuner, KL411MX2 (See page 20 for details)

PICTURE TUBE

V901	23112222	Picture Tube, 370AUB22

*NSP: Not available as a service part